

ANNUAL MANAGEMENT REPORT FOR THE
SHELLFISH FISHERIES OF THE WESTWARD REGION, 1999



Regional Information Report No. 4K00-55

Alaska Department of Fish and Game
Division of Commercial Fisheries
211 Mission Road
Kodiak, Alaska 99615

July 2000

Doug Eggers, Fisheries Scientist
CF - Juneau

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By

Westward Region Shellfish Management Staff

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ABSTRACT

The Alaska Department of Fish and Game (ADF&G) Westward Region includes all waters in the Gulf of Alaska south of Cape Douglas (58° 52' N lat.) to the U.S.-Russia Convention line of 1867 and all waters of the Bering Sea northeast from the U.S.-Russia convention line of 1867 to Norton Sound (Figure 1-1). The species harvested during the 1999 commercial shellfish fisheries include red king crabs *Paralithodes camtschaticus*, golden king crabs *Lithodes aequispinus*, snow crabs *Chionoecetes opilio*, Dungeness crabs *Cancer magister*, and weathervane scallops *Patinopecten caurinus*. In recent years, minor fisheries have occurred for hair crabs *Erimacrus isenbeckii*, grooved Tanner crabs *Chionoecetes tanneri*, triangle Tanner crabs *Chionoecetes angulatus*, various snail and clam species, giant Pacific octopus *Octopus dofleini*, red sea cucumbers *Parastichopus californicus*, and green sea urchins *Strongylocentrotus droebachiensis*. Historically, the Westward Region has supported large pandalid shrimp, blue king crab *Paralithodes platypus*, and Tanner crab *Chionoecetes bairdi* fisheries.

This report presents details on the commercial fishery harvest, participation, and value, for open access and community development quota (CDQ) fisheries for the Kodiak, South Peninsula, Eastern Aleutian, Western Aleutian, Bristol Bay, Pribilof Island, St. Matthew Island, and Bering Sea Areas. Approximately 500 catcher vessels, 21 catcher processors, 19 shorebased processors, and 11 floating processors were involved in harvesting over 269.5 million pounds of shellfish worth an estimated exvessel value of \$221.8 million from the Westward Region in 1999.

Historical and present day fishery management practices, areas of concern, and status of stocks are discussed for each commercial fishery. Activity from the mandatory onboard observer programs for the weathervane scallop, king crab, snow, and Tanner crab fisheries are summarized. Information on the pot limit buoy tag program is also included.

OVERVIEW

The Alaska Department of Fish and Game (ADF&G) Westward Region includes all waters in the Gulf of Alaska south of Cape Douglas (58° 52' N lat.) to the U.S.-Russia Convention line of 1867 and all waters of the Bering Sea northeast from the U.S.-Russia convention line of 1867 to Norton Sound (Figure 1-1). Encompassed are 525,000 square miles of the most productive shellfish habitat in the world. The species harvested during the 1999 commercial shellfish fisheries include red king crabs *Paralithodes camtschaticus*, golden king crabs *Lithodes aequispinus*, snow crabs *Chionoecetes opilio*, Dungeness crabs *Cancer magister*, and weathervane scallops *Patinopecten caurinus*. In recent years, minor fisheries have occurred for hair crabs *Erimacrus isenbeckii*, grooved Tanner crabs *Chionoecetes tanneri*, triangle Tanner crabs *Chionoecetes angulatus*, various snail and clam species, giant Pacific octopus *Octopus dofleini*, red sea cucumbers *Parastichopus californicus*, and green sea urchins *Strongylocentrotus droebachiensis*. Historically, the Westward Region has supported large pandalid shrimp, blue king crab *Paralithodes platypus*, and Tanner crab *Chionoecetes bairdi* fisheries.

The regional ADF&G office is located in Kodiak with a management office in Dutch Harbor. This report documents commercial shellfisheries in the region. ADF&G fishery biologists are charged with management and research programs associated with all commercial, subsistence, and personal use shellfish fisheries in state and federal waters. The full-time shellfish management and observer staff consists of nine biologists, one secretary, and one administrative clerk. Thirteen seasonal personnel are hired for shellfish assessment cruises, logbook programs, shipboard observations, interviews, dockside sampling, data entry, clerical assistance, and oversight staff for the mandatory onboard shellfish observer program.

Most Bering Sea and Aleutian Island (BSAI) crab fisheries are managed under a federal fisheries management plan (FMP) which establishes a cooperative management regime that defers crab management to the state with federal oversight. State regulations for BSAI FMP category fisheries are also subject to provisions of the Magnuson-Stevens Fishery Conservation and Management Act. None of the shellfish fisheries in the Gulf of Alaska (GOA) portion of the region are covered by a federal fisheries management plan.

In 1999, approximately 500 catcher vessels, 21 catcher processors, 19 shorebased processors, and 11 floating processors were involved in harvesting and processing shellfish resources (Table 1-1). The 1999 Westward Region crab landings of 211.5 million pounds had an exvessel value of \$254 million (Table 1-2). The landings of crab were near levels of harvest seen in the early 1990s, bolstered by large Bering Sea snow crab and Bristol Bay red king crab harvests. Exvessel prices were high for Bristol Bay and Aleutian Island king crab due to stable Asian economies, increased domestic demand for crab, decreased production from Russian king crab fisheries, and fishery closures in St. Matthew and the Pribilof Island king crab fisheries. Snow crab exvessel price was also up in 1999. The snow crab fishery was the largest shellfishery in the Westward Region, with landings of 194.2 million pounds, and largest in value, worth \$171 million. The red king crab fishery was the second most valuable fishery, followed by the Aleutian Island golden king crab fishery.

Shrimp harvest in 1999 was limited to minor participation in the Kodiak Area and Bering Sea (Table 1-3). Harvest from the Bering Sea remains confidential because only two vessels participated. Three vessels sold 6,035 pounds of trawl caught shrimp off the docks in Kodiak. The results of a 1998 shrimp survey, which was conducted in historically productive sections of the Kodiak Area, indicated that shrimp stocks continue to be extremely depressed.

The 1999 king crab harvest was 16.8 million pounds (Table 1-4). The red king crab seasons were closed in the Kodiak, Alaska Peninsula, and Dutch Harbor Areas. These areas have been closed continuously since 1983. The department has surveyed these areas annually since 1998 to assess population health and abundance, which continue to show little or no recruitment. The St. Matthew Island and Pribilof Island Sections of the Bering Sea were also closed to king crab fishing in 1999 following continued declines in male and female king crab population estimates from annual National Marine Fisheries Service (NMFS) trawl surveys.

The Bristol Bay red king crab season was opened to fishing in 1999. The harvest of 11.7 million pounds was worth \$69.1 million in exvessel value, the most valuable king crab fishery in the state. In 1999, approximately five million pounds were harvested in the Aleutian Islands golden king crab fishery. With a \$9.3 million exvessel fishery value, this was the second most valuable king crab fishery in the Westward Region.

The 1999 snow crab fishery produced 194.2 million pounds (Table 1-5). The value rose to \$170.9 million in 1999 from \$138.7 million in 1998. The Tanner crab fisheries in the Westward Region did not open in 1999. The depressed nature of Tanner crab stocks in the Bering Sea resulted in the stock being classified as overfished under the FMP criteria during 1999. In the GOA, Tanner crab populations are still below threshold levels required for reopening the commercial fisheries. Fisheries for deep water grooved and triangle Tanner crabs developed during the mid 1990s. No harvest of deep water Tanner crab species occurred in the Westward Region in 1999.

The 1999 Dungeness crab harvest was 550,568 pounds from the Kodiak area (Table 1-6). The harvest from other districts remains confidential because less than three vessels participated. Though an increase from 1998, this amount of harvest remains well below the level harvested during the 1980s and early 1990s.

In September 1988, the Alaska Board of Fisheries (BOF) adopted the mandatory observer requirement for vessels processing king and Tanner crabs. The BOF adopted the same requirements for vessels processing snow crabs in 1990. The regulations required industry to fund the observers that are provided by a third party contractor and certified by the ADF&G. The observer program has been active for over ten years with observers participating in nine fisheries annually. Since the program's inception, ADF&G biologists have come to rely on observers to provide biological data on both targeted species and bycatch. In addition, an observer's presence onboard catcher processors have deterred the taking of undersized crab.

Fisheries in the Westward Region are managed by areas that vary according to species. This report summarizes activity in the Bering Sea, Aleutian Islands, Alaska Peninsula, and Kodiak areas. The pot limit buoy tag program, Community Development Quota crab fisheries of the Bering Sea,

weathervane scallop fisheries, and the mandatory onboard observer program activities for 1999 are also summarized in this report.

Table 1-1. Shellfish processors operating in the Westward Region during the 1999 fishing seasons.

Location	Company	Products ^a
SHORE BASED PROCESSORS		
Kodiak	Alaska Fresh Seafoods	D,K
	Alaska Pacific Seafoods	M
	Cook Inlet Processing	M,D,K
	Deep Blue Seafoods	M
	International Seafoods of Alaska	D
	Ocean Beauty	K,T
King Cove	Peter Pan Seafoods	T
Akutan	Trident Seafoods	K,T
Dutch Harbor	Alyeska Seafoods	K,T
	Osterman Fish	K,T
	Prime Alaska	K,T
	Royal Aleutian Seafoods	M,D,K,T
	Unisea Seafoods Incorporated	M,K,T
	Westward Seafoods	K,T
Saint Paul	Dutch Harbor Fishermen of Alaska	T
	Icicle Seafoods (Arctic Star)	K
	Trident Seafoods	M,K,T
	Unisea Seafoods	T
Adak	Adak Seafoods	K
FLOATER PROCESSORS		
	Alaska Packer	T
	Aleutian Falcon	T
	Blue Wave	K,T
	Coastal Star	K,T
	Independence	T
	Northern Victor	K,T
	Omni Sea	T
	Sea Alaska	K,T
	Snopac	T
	Stellar Sea	K,T
	Yard Arm Knot	T
CATCHER PROCESSORS		
	Alaskan Enterprise	K,T
	Arctic Queen	M
	Baranof	K,T
	Blue Dutch	K,T
	Bountiful	K,T
	Carolina Boy	M
	Carolina Girl	M
	Courageous	K,T
	Deep Sea Harvester	K,T
	Forum Star	M
	Kiska Enterprise	K,T
	La Brisa	M
	Mr. B	K,T
	Ocean Hunter	M
	Patricia Lee	K

-Continued-

Table 1-1. (page 2 of 2)

Location	Company	^a Products
CATCHER PROCESSORS (cont.)	Pavlof	K,T
	Pro Surveyor	K,T
	Provider	M
	Pursuit	M
	Royal Enterprise	K,T
	Westward Wind	K,T

^a Product Types

K=King Crab

T=Tanner Crab

S=Shrimp

D=Dungeness

M=Weathervane scallops, Misc. clams, Hair crab, Octopus,
Green Urchins, Red Sea Cucumbers.

Table 1-2. Westward Region king crab, shrimp, Tanner crab, snow crab, and Dungeness crab economic profiles, 1950-1999.

Year	SHRIMP			KING CRAB			TANNER CRAB ^a			DUNGENESS CRAB			TOTAL	
	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Value ^d
1950				2.10										
1951				0.80										
1952				0.70										
1953				3.30										
1954				6.60										
1955				5.50										
1956				10.90										
1957				12.30										
1958				12.40										
1959				16.40										
1960	3.40	0.04	0.13	30.40	0.09	2.58							33.90	2.71
1961	11.00	0.04	0.44	38.60	0.10	3.66							49.60	4.10
1962	12.60	0.04	0.50	49.50	0.10	4.95				1.90	0.09	0.17	64.00	5.62
1963	10.10	0.04	0.43	66.80	0.10	6.68				2.40	0.09	0.21	79.30	7.32
1964	3.90	0.04	0.15	91.80	0.10	9.18				4.20	0.09	0.38	99.90	9.71
1965	13.80	0.04	0.55	138.20	0.13	17.68				3.30	0.12	0.40	155.30	18.63
1966	24.10	0.05	1.08	136.20	0.11	14.90				1.20	0.13	0.16	161.50	16.14
1967	39.60	0.05	1.78	103.40	0.26	26.88	0.10	0.07	0.01	6.60	0.13	0.86	149.70	29.53
1968	39.70	0.04	1.58	69.00	0.26	17.94	2.70	0.10	0.27	8.00	0.14	1.12	119.40	20.91
1969	45.00	0.06	2.48	54.70	0.28	15.32	8.50	0.11	0.64	3.80	0.16	1.08	115.00	19.82
1970	68.20	0.04	2.73	49.90	0.30	14.97	11.30	0.11	1.24	5.70	0.14	0.80	135.10	19.74
1971	88.60	0.04	3.54	52.80	0.39	20.59	9.80	0.11	1.07	1.40	0.18	0.25	152.60	25.45
1972	78.00	0.04	3.12	70.40	0.55	38.72	15.60	0.13	2.03	2.10	0.40	0.84	166.10	44.71
1973	117.80	0.08	9.42	69.30	0.45	31.18	38.00	0.17	6.46	2.20	0.50	1.10	247.10	48.16
1974	104.00	0.08	8.32	94.30	0.45	42.43	43.40	0.20	8.68	0.80	0.47	0.38	242.50	59.81
1975	92.10	0.08	7.37	96.70	0.66	63.82	33.20	0.17	5.64	0.60	0.61	0.37	222.60	77.20
1976	119.30	0.10	11.93	101.40	1.37	138.91	64.80	0.20	12.96	0.08	0.15	0.01	285.60	168.81
1977	110.60	0.13	14.38	94.60	1.34	126.76	86.40	0.33	28.51	0.10	0.30	0.03	291.70	169.68
1978	64.20	0.17	10.59	119.90	1.60	191.80	114.30	0.43	49.15	1.30	0.75	0.98	301.40	253.16
							1.7	.38	.64					

-Continued-

Table 1-2. (page 2 of 3)

Year	SHRIMP			KING CRAB			TANNER CRAB ^a			DUNGENESS CRAB			TOTAL	
	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Value ^d
1979	44.60	0.23	10.03	151.60	0.95	144.02	84.20	0.55	46.30	1.40	0.75	1.05	314.00	211.06
							32.20	0.30	9.66					
1980	43.10	0.29	12.49	189.60	1.05	199.08	4.00	0.55	35.20	2.00	0.45	0.90	338.20	255.97
							39.50	0.21	8.30					
1981	21.50	0.27	5.81	85.30	2.00	170.60	49.30	0.65	32.05	5.60	0.70	3.92	214.40	226.08
							52.70	0.26	13.70					
1982	11.20	0.27	3.02	38.50	3.75	144.48	34.20	1.65	56.43	5.30	0.75	3.98	118.50	229.19
							29.30	0.73	21.38					
1983	2.80	0.35	0.98	25.00	3.00	75.00	31.40	1.25	39.25	5.90	1.05	6.20	91.30	130.60
							26.20	0.35	9.17					
1984	2.90	0.33	0.95	17.10	2.75	47.02	18.80	1.10	20.68	6.00	1.40	8.40	70.80	86.22
							26.00	0.30	7.80					
1985	1.20	0.20	0.24	20.40	2.50	51.00	18.40	1.50	27.60	4.60	1.20	5.52	109.10	103.71
							64.50	0.30	19.35					
1986	0.50	0.25	0.13	17.30	3.50	60.50	13.20	1.90	25.08	1.20	1.15	1.38	128.70	144.99
							96.50	0.60	57.90					
1987	0.00	0.00	0.00	27.30	3.50	95.46	7.60	2.11	16.02	1.70	1.25	2.07	138.50	189.98
							101.90	0.75	76.43					
1988	Confidential			20.00	3.98	79.37	9.90	2.36	23.40	2.30	1.06	2.44	167.60	209.86
							135.40	0.77	104.25					
1989	0.00	0.00	0.00	22.70	4.02	91.07	14.00	2.94	41.17	3.10	1.10	3.40	189.30	247.74
							149.50	0.75	112.10					
1990	0.00	0.00	0.00	34.70	4.21	145.93	28.20	1.91	53.86	3.00	1.51	4.55	227.60	307.74
							161.70	0.64	103.40					

-Continued-

Table 1-2. (page 3 of 3)

Year	SHRIMP			KING CRAB			TANNER CRAB ^a			DUNGENESS CRAB			TOTAL	
	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Price ^c	Value ^d	Lbs. ^b	Value ^d
1991	0.00	0.00	0.00	28.30	2.94	83.25	42.00	1.14	48.02	1.50	1.50	2.04	400.40	297.64
							328.60	0.50	164.30					
1992	Confidential			19.10	3.79	72.56	34.30	1.55	53.21	1.70	0.86	1.43	370.40	284.85
							315.30	0.50	157.65					
1993	Confidential			26.60	3.47	92.30	25.30	1.69	42.76	1.70	0.92	1.56	284.40	309.71
							230.80	0.75	173.10					
1994	0.00	0.00	0.00	12.60	4.21	53.00	7.80	3.75	24.25	1.20	1.20	1.44	171.40	278.44
							149.80	1.30	194.74					
1995	0.00	0.00	0.00	11.90	2.67	31.82	4.20	2.80	11.85	0.70	1.72	1.20	92.10	227.73
							75.30	2.43	182.86					
1996	Confidential			21.00	2.46	51.66	1.81	2.50	4.52	0.90	1.06	1.00	88.10	142.78
							64.40	1.33	85.60					
1997	Confidential			18.10	2.64	47.70	0.00	0.00	0.00	1.00	2.10	2.10	138.60	142.30
							119.50	0.79	92.50					
1998	0.01	0.22	0.00	20.70	2.27	60.00	0.00	0.00	0.00	0.46	1.46	0.67	273.37	199.37
							252.20	0.55	138.70					
	<0.01	NA	NA	16.79	4.89	82.23	0.00	0.00	0.00	0.55	1.57	0.86	269.54	221.79
1999							194.20	0.88	170.90					

^a*C. bairdi* (top line) and *C. opilio* (bottom line).^bMillions of pounds.^cDollars.^dMillions of dollars.

Table 1-3. Westward Region historic domestic trawl shrimp catch, 1960-1999.

Calendar Year	Kodiak	Chignik	Peninsula	Aleutians	Total
1960	3,379,000				3,379,000
1961	11,083,500				11,083,500
1962	12,654,300				12,654,300
1963	10,118,500				10,118,500
1964	3,946,900				3,946,900
1965	13,810,500				13,810,500
1966	24,097,100				24,097,100
1967	38,722,100	879,900			39,602,000
1968	34,468,700	1,153,700	4,137,400		39,759,800
1969	41,243,600	419,900	3,365,600		45,029,100
1970	62,369,300	1,226,800	4,634,700		68,230,800
1971	82,153,724	987,900	5,532,400		88,674,024
1972	58,352,319	4,829,800	14,740,800	94,627	78,017,546
1973	70,511,477	26,884,200	20,022,000	456,179	117,873,858
1974	48,771,375	23,392,400	26,145,900	5,749,407	104,059,082
1975	46,806,799	24,435,400	20,044,400	893,567	92,180,166
1976	51,400,472	27,059,700	37,170,300	3,670,609	119,301,081
1977	31,801,573	27,797,739	46,454,376	4,599,858	110,653,546
1978	22,820,135	22,976,720	11,812,795	6,618,263	64,227,913
1979	14,540,901	23,722,330	3,134,367	3,236,721	44,634,319
1980	27,783,437	12,843,270	C L O S E D	2,479,350	43,106,057
1981	19,030,341	70,948	C L O S E D	2,398,458	21,499,747
1982	10,884,059	0 ^a	0 ^a	341,551	11,225,610
1983	2,779,030	0	0	5,600	2,784,630
1984	3,023,438	0	0	0 ^a	3,023,438
1985	1,159,912	0	0	0	1,159,912
1986	453,468	0	0	0	453,468
1987	0 ^a	0	0	0	0 ^a
1988	Confidential ^b	0	0	0	Confidential ^b
1989	0 ^a	0	0	0	0
1990	0 ^a	0	0	0	0
1991	0 ^a	0	0	0	0
1992	0	0	0	Confidential ^b	Confidential ^b
1993	1,704	0	0	Confidential ^b	Confidential ^b
1994	0	0	0	0	0
1995	0	0	0	0	0
1996	Confidential ^b	0	0	0	0
1997	Confidential ^b	0	0	0	0
1998	11,905	0	0	0	0
1999	6,035	0	0	Confidential ^b	Confidential ^b
AVERAGE	18,704,640	4,967,018	4,929,876	763,605	29,364,647

^a Season Open - No Catch Reported^b Catches by less than three vessels remain confidential

Table 1-4. Westward Region historic king crab catch by registration area (in thousands of pounds), 1950-1999.

Year	K Kodiak	M Alaska Peninsula	O Dutch Harbor	R Adak	Q Bering Sea	T Bristol Bay	Total Westward Region	Foreign	Total
1950	60.0	2,124.0	0.0	0.0	0.0	0.0	2,184.0	0.0	2,184.0
1951	200.0	599.0	0.0	0.0	0.0	0.0	799.0	0.0	799.0
1952	400.0	298.0	0.0	0.0	0.0	0.0	698.0	0.0	698.0
1953	900.0	380.0	0.0	0.0	0.0	2,000.0	3,280.0	11,356.0	14,636.0
1954	4,000.0	317.0	0.0	0.0	0.0	2,329.0	6,646.0	8,086.0	14,732.0
1955	2,000.0	1,641.0	0.0	0.0	0.0	1,878.0	5,519.0	8,693.0	14,212.0
1956	4,800.0	4,221.0	0.0	0.0	0.0	1,896.0	10,917.0	8,308.0	19,225.0
1957	5,000.0	6,687.0	0.0	0.0	0.0	588.0	12,275.0	8,548.0	20,823.0
1958	5,200.0	7,246.0	0.0	0.0	0.0	7.0	12,453.0	8,136.0	20,589.0
1959	10,200.0	6,167.0	0.0	0.0	0.0	0.0	16,367.0	11,602.0	27,969.0
1960/61	21,064.0	6,700.0	0.0	2,093.7	0.0	598.0	30,456.5	24,611.0	55,067.5
1961/62	28,962.9	3,900.0	533.0	4,776.0	0.0	459.0	38,630.9	40,404.0	79,034.0
1962/63	37,626.7	2,273.0	1,536.0	8,006.5	0.0	74.0	49,543.2	49,516.2	102,782.2
1963/64	37,716.2	6,539.0	3,893.0	17,903.7	0.0	747.0	66,798.9	56,671.0	123,469.9
1964/65	41,596.5	14,354.0	13,761.0	21,193.0	0.0	910.0	91,815.0	63,076.0	154,891.3
1965/66	94,431.0	14,713.0	19,196.0	8,040.0	0.0	1,762.0	138,142.4	41,405.0	179,547.4
1966/67	73,817.8	22,577.0	32,852.0	5,883.1	0.0	997.0	136,126.9	43,998.0	180,124.9
1967/68	43,448.5	17,252.0	22,709.0	16,948.9	0.0	3,102.0	103,460.4	32,528.0	135,988.4
1968/69	18,211.4	10,944.0	11,300.0	19,874.8	0.0	8,687.0	69,017.2	27,681.0	96,698.2
1969/70	12,200.5	4,137.0	8,950.0	19,055.4	0.0	10,403.0	54,745.9	14,113.0	68,858.9
1970/71	11,719.9	3,425.7	9,652.0	16,057.0	NF	8,559.2	49,913.6	12,930.0	62,843.6
1971/72	10,884.1	4,123.1	9,391.6	15,475.9	NF	12,995.8	52,869.7	6,188.0	59,057.7
1972/73	15,479.9	4,069.3	10,450.4	18,724.1	NF	21,744.9	70,490.7	4,721.0	75,211.7
1973/74	14,397.3	4,260.6	12,722.7	9,741.5	1,276.6	26,913.6	69,331.8	1,279.0	70,610.8
1974/75	23,582.7	4,572.1	13,991.1	2,775.0	7,107.3	42,266.3	94,274.0	2,618.0	96,892.0
1975/76	24,061.6	2,605.3	15,906.6	437.1	2,433.7	51,326.2	96,747.4	0.0	96,747.4
1976/77	17,966.8	958.8	10,198.4	2.3	8,356.1	63,919.7	101,399.8	0.0	101,399.8

Continued

Table 1-4 (page 2 of 2)

Year	K Kodiak	M Alaska Peninsula	O Dutch Harbor	R Adak	Q Bering Sea	T Bristol Bay	Total Westward Region	Foreign	Total
1977/78	13,503.6	726.3	3,684.4	953.0	8,201.8 ^a	69,967.8	94,567.9	0.0	94,567.9
1978/79	12,021.8	3,093.8	6,824.1	807.2	10,387.7 ^a	87,618.3	119,933.7	0.0	119,933.7
1979/80	14,608.9	4,453.5	15,010.9	490.7	9,230.3 ^a	107,828.0	151,647.4	0.0	151,647.4
1980/81	20,448.6	5,080.6	19,053.6	1,478.4	11,543.8	129,948.5	187,553.5	0.0	187,553.5
1981/82	24,237.6	3,147.5	5,231.1	2,843.0	13,772.5	33,591.4	85,291.4	0.0	85,291.4
1982/83	8,729.2	1,627.7	1,616.2	9,708.1	13,447.3	3,001.2	38,497.8	0.0	38,497.8
1983/84	111.4 ^b	CLOSED	1,810.0	10,109.6	11,701.9	CLOSED	25,463.1	0.0	25,463.1
1984/85	22.2 ^b	CLOSED	1,521.1	5,508.7	4,701.3	4,182.4	17,115.2	0.0	17,115.2
1985/86	63.6 ^b	CLOSED	1,968.2	11,931.0	2,959.8	4,174.9	20,405.4	0.0	20,405.4
1986/87	146.5 ^b	CLOSED	1,869.2	13,510.2	1,262.1	11,393.9	17,308.5	0.0	17,308.5
1987/88	67.2 ^b	CLOSED	1,383.2	3,190.0 ^c	2,200.9	12,289.1	19,130.4	0.0	19,130.4
1988/89	2.8 ^b	CLOSED	1,545.1	9,571.1 ^d	1,488.3	7,387.8	19,955.1	0.0	19,955.1
1989/90	*	CLOSED	1,852.2	9,251.9 ^d	1,428.2	10,264.8	22,657.8	0.0	22,657.8
1990/91	*	CLOSED	1,718.8	9,606.3	1,725.3	20,362.3	33,412.7	0.0	33,412.7
1991/92	0.0	CLOSED	1,447.7	6,128.7 ^d	3,372.1	17,177.9	28,126.4	0.0	28,126.4
1992/93	*	CLOSED	1,357.0	7,248.1 ^d	2,474.0	8,043.0	19,122.1	0.0	19,122.1
1993/94	*	CLOSED	915.5	5,368.4	5,675.0	14,628.6	26,587.5	0.0	26,587.5
1994/95	CLOSED	CLOSED	1,750.3	5,205.5	5,206.5	CLOSED	12,603.0	0.0	12,603.0
1995/96	CLOSED	CLOSED	1,994.0	4,644.7	5,304.7	CLOSED	11,943.4	0.0	11,943.4 ^e
1996/97	CLOSED	CLOSED	^e	5,854.2 ^e	5,501.9	8,405.6	19,761.7	0.0	19,761.7
1997/98	CLOSED	CLOSED	^e	5,657.4	6,098.1	8,756.5	20,512.0	0.0	20,512.0
1998/99	CLOSED	CLOSED	^e	1,350.0	4,617.7	14,757.4	20,725.1	0.0	20,725.1
1999/2000	CLOSED	CLOSED	^e	4,939.0	177.1	11,670.2	16,786.3	0.0	16,786.3

* Confidential catch.

^aFishing year - July 1 through June 30.^bGolden king and red king crab closed since 1982/83.^cThrough January 31.^dCalendar year.^eDutch Harbor Area combined with Adak Area to form the Aleutian Area beginning in 1996.

Table 1-5. Westward Region historic Tanner and snow crab catch (in pounds), 1965-1999.

Year ^a	Kodiak	Chignik ^b	South Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea <i>C. opilio</i>	Bering Sea <i>C. bairdi</i>	Total Westward Harvest	Total Foreign Harvest
1965	0	0	0	0	0	0	0	0	3,936,000
1966	0	0	0	0	0	0	0	0	7,290,000
1967	110,961	0	5,000	0	0	0	0	115,961	24,000,000
1968	2,560,687	0	131,700	0	0	0	17,900	2,710,287	30,940,000
1969	6,796,477	0	644,400	0	0	0	1,008,900	8,449,777	47,668,000
1970	7,749,859	0	2,022,427	0	0	0	1,014,700	11,259,447	47,828,000
1971	7,436,414	152,256	2,140,755	0	0	0	166,100	9,875,888	39,886,000
1972	11,898,054	23,343	3,618,883	0	0	0	107,761	15,662,354	31,186,000
1973	31,113,459	747,788	5,615,563	62,128	168,354	0	231,668	38,008,640	27,886,000
1974	25,479,717	4,202,671	9,503,366	498,836	71,887	0	5,044,197	43,409,968	27,912,000
1975	17,535,844	3,649,444	5,195,800	77,164	3,350	0	7,284,378	33,225,873	18,456,000
1976	23,446,245	6,926,161	11,201,941	534,295	62,180	0	22,341,475	64,818,920	19,286,000
1977	20,720,079	5,672,919	6,773,838	1,301,654	0	0	51,455,221	86,405,326	21,520,173
1978	33,271,472	4,693,830	7,446,270	2,624,016	237,512	1,716,124	66,648,954	116,014,238	33,057,796
1979	29,173,807	2,536,105	8,684,408	1,092,311	197,244	31,102,832	42,547,174	116,411,771	32,914,536
1980	18,623,875	3,517,920	3,961,251	879,807	337,297	39,344,323	36,614,315	103,507,133	15,636,125
1981	11,748,629	3,653,723	3,294,106	654,514	220,716	50,483,055	29,732,086	102,056,808	0
1982	13,756,159	3,240,526	4,589,042	739,694	838,627	29,351,474	11,008,779	63,542,301	0
1983	18,927,061	3,497,370	2,863,798	547,830	448,399	26,128,410	5,273,881	57,686,749	0
1984	14,789,903	659,043	1,789,883	239,395	191,954	26,813,074	1,208,223	45,691,225	0
1985	12,024,553	385,838	2,561,868	165,529	66,549	65,998,875	3,151,498	82,900,497	0
1986	8,974,520	184,907	3,763,761	166,939	72,441	97,984,539	0	109,674,455	0
1987	4,833,473	195,060	2,400,784	160,292	42,761	101,903,388	0	109,535,758	0
1988	3,888,906	183,111	3,328,809	309,918	169,289	134,060,185	2,210,394	144,150,612	0
1989	5,208,999	323,120	1,055,082	328,696	53,181	149,455,340	7,012,965	163,437,891	0
1990	3,456,314	0	0	171,785	48,746	161,742,748	24,549,299	189,968,822	0
1991	1,917,713	0	0	50,038	14,779	328,647,269	40,081,555	370,711,294	0
1992	2,400,213	0	0	98,703	7,825	315,302,034	31,796,381	349,605,156	0
1993	1,318,446	0	0	118,609	2,293	230,787,000	23,908,272	256,134,620	0
1994	0	0	0	0	0	149,775,765	7,766,886	157,542,651	0
1995	0	0	0	0	0	75,252,677	4,233,061	79,485,738	0
1996	0	0	0	0	0	65,712,797	18,060,077	67,518,874	0
1997	0	0	0	0	0	119,452,070	0	119,452,070	0
1998	0	0	0	0	0	252,188,358	0	138,703,597	0
1999	0	0	0	0	0	194,200,066	0	194,200,066	0

^a Calendar year.

^b Chignik and South Peninsula catches combined 1967 through 1970.

Table 1-6. Westward Region historic Dungeness crab catch (in pounds) by district, 1962-1999.

Calendar Year	Kodiak	Alaska Peninsula	Aleutians	Total
1962	1,904,567	0	0	1,904,567
1963	2,487,512	0	0	2,487,512
1964	4,162,182	0	0	4,162,182
1965	3,311,571	0	0	3,311,571
1966	1,148,600	0	0	1,148,600
1967	6,663,668	0	0	6,663,668
1968	6,829,061	1,259,000	0	8,088,061
1969	5,834,628	1,056,000	0	6,890,628
1970	5,741,438	13,000	0	5,754,438
1971	1,445,864	11,000	0	1,456,864
1972	2,059,536	65,000	0	2,124,536
1973	2,000,526	194,500	0	2,195,026
1974	750,057	0	60,517	810,574
1975	639,813	0	4,408	644,221
1976	87,110	0	0	87,110
1977	113,026	0	0	113,026
1978	1,362,306	0	0	1,362,306
1979	1,313,650	102,320	1,101	1,417,071
1980	2,011,736	0	0	2,011,736
1981	5,566,463	42,296	0	5,608,759
1982	4,546,311	779,600	36,034	5,361,945
1983	4,752,148	1,200,978	8,975	5,962,101
1984	5,304,921	647,497	91,736	6,044,154
1985	4,153,877	462,258	16,750	4,632,885
1986	965,095	179,367	10,897	1,155,359
1987	1,450,983	182,706	26,627	1,660,316
1988	2,125,032	179,022	22,634	2,326,688
1989	3,077,937	^a	11,124	3,089,061 ^b
1990	2,879,955	65,806	17,365	2,963,126
1991	1,414,499	80,248	7,412	1,502,159
1992	1,656,793	^a	5,649	1,662,442
1993	1,369,889	273,811	7,531	1,651,231
1994	948,461	277,639	^a	1,226,100 ^b
1995	527,434	^a	^a	527,434 ^b
1996	668,772	112,388	0	781,160
1997	529,601	240,120	0	769,729
1998	370,836	96,073	^a	466,909 ^b
1999	550,568	^a	0	550,568 ^b

^a Catch confidential.

^b Total does not include confidential catch.

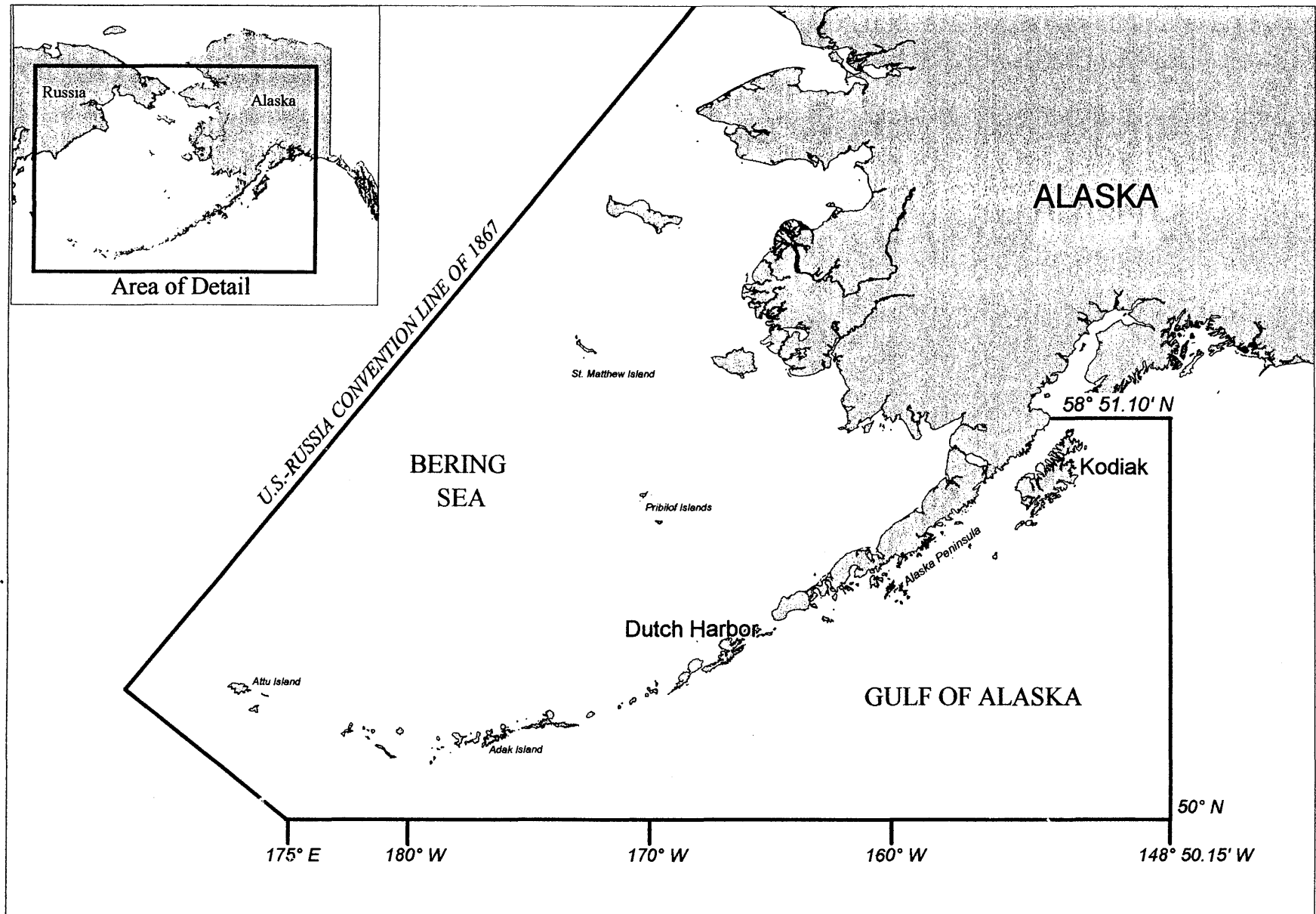


Figure 1-1. Alaska Department of Fish and Game Westward Region for shellfish management.

ANNUAL MANAGEMENT REPORT FOR THE
SHELLFISH FISHERIES OF THE KODIAK AREA, 1999.

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KODIAK AREA

Introduction

The Kodiak shellfish Area includes the Pacific Ocean waters south of the latitude of Cape Douglas (58°52' N lat.) on the Alaska Peninsula, east of the longitude of Cape Kumlik (157°27' W long.), and west of 148°50' W long. The management area varies slightly for shrimp, where it extends from the latitude of Cape Douglas to the longitude of Kilokak Rocks on the Alaska Peninsula (156°19'25" W long.). This report reviews the 1999 shellfish fisheries within the area and provides summaries of the history involving each fishery.

Historically, the Kodiak area has supported substantial red king crab *Paralithodes camtschaticus*, Tanner crab *Chionoecetes bairdi*, and northern or pink shrimp *Pandalus borealis* fisheries. Red king and Tanner crab populations are currently depressed to levels that do not allow commercial harvests. Historically productive sections and bays for shrimp also have depressed populations and are currently closed. Some offshore areas remain open to exploratory shrimp fishing. Effort for shrimp in these areas has been minimal during the 1990s.

Dungeness crab *Cancer magister*, red sea cucumber *Parastichopus californicus*, octopus *Octopus dofleini*, and weathervane scallop *Patinoplectin caurinus* were the principal commercial shellfish species harvested from the Kodiak Area in 1999. A small harvest of green sea urchins *Strongylocentrotus droebachiensis* and trawl-caught shrimp also occurred. Approximately two million pounds of shellfish were landed at the Port of Kodiak during 1999, with an exvessel value of \$ 4.5 million (Table 2-1). The single most valuable shellfish species harvested from the Kodiak Area was the weathervane scallop worth \$ 1.7 million to the fleet. Some landings of snow *Chionoecetes opilio* and king crabs harvested in the Bering Sea occurred at processors in Kodiak. Red king crabs harvested in Bristol Bay and landed at the Port of Kodiak matched the weathervane scallop fishery for value, also with an exvessel value of \$ 1.7 million.

Catches are reported by landings from individual statistical areas and summarized by districts or sections. Figure 2-1 shows the statistical areas for the Kodiak Area with an overlay of the Tanner crab and sea cucumber fishery sections.

A discussion of each shellfishery is grouped by management area except for the Kodiak Area weathervane scallop fishery, that is contained in the statewide weathervane scallop section of this report. Eight emergency orders were issued during 1999 for the shellfish fisheries in the Kodiak Area (Table 2-2).

TANNER CRAB

Introduction

The Kodiak District for Tanner crab *Chionoecetes bairdi* are the waters of Registration Area J south of the latitude of Cape Douglas (58° 51' 06" N lat.), west of the longitude of Cape Fairfield (148°

50° 15' W long.) and east of the longitude of Cape Kumlik (157° 27' W long.). The District is further subdivided into eight sections (Figure 2-1).

Historic Background

The domestic Tanner crab fishery for Kodiak and waters south of the Alaska Peninsula began in 1967 when less than 200,000 pounds were landed. As king crab stocks declined in the late 1960s interest increased in the Tanner crab fishery. During this period, fishermen developed the use of wooden slats in the tunnel eye of the pot to reduce the height of the opening to 4 inches or less which did not allow the larger king crab to enter the pot.

Considering the abundance of Tanner crab and availability of fishing gear, the commercial fishery was slow to develop. Four factors contributed to this slow development:

1. Relatively low consumer acceptance of Tanner crab;
2. Competition on the U.S. market from imported Tanner crabmeat;
3. A black encrustment on crab shell now known as black mat syndrome;
4. Uneconomical extraction of meat from the shell. Extraction of meat from Tanner crab legs using equipment and methods designed for the larger king crab required a high amount of labor per yield. Shell fragments in shoulder meat required considerable hand labor for removal.

By the 1972/73 season, market conditions had improved and Tanner crab had established itself as a dominant winter and spring fishery in the Kodiak Area. In 1973, the Alaska Department of Fish and Game (ADF&G) initiated an experimental survey program that used king crab pots as the means of capture. The primary goals of these surveys were to estimate the annual relative abundance of crabs and to predict recruitment trends two to four years in advance of crabs attaining commercial harvest size. These estimates would allow ADF&G to establish annual harvest levels.

As a result of the newly initiated Tanner crab survey programs, in 1974 and 1975, the Alaska Board of Fisheries (BOF) set a guideline harvest range on Tanner crab of 35 to 55 million pounds for the Kodiak, Chignik, and South Peninsula Areas. In addition, in 1975, the BOF adopted an April 30 season closure to protect crab at the onset of the mating season. In 1976, the BOF established a 5½-inch carapace width (CW) minimum size limit, which allows mature males at least one full breeding season before becoming available for commercial harvest. Beginning December 1978, the federal government assumed joint Tanner crab management responsibilities with the State of Alaska in the Exclusive Economic Zone (EEZ) from 3 to 200 nautical miles offshore in Alaskan waters. This joint management was accomplished through a Fishery Management Plan (FMP) promulgated by the North Pacific Fishery Management Council (NPFMC).

The commercial fishery peaked during the 1977/78 season when over 33 million pounds were harvested from the Kodiak District (Table 2-3). The commercial catch began to decline in the late 70s and early 80s. In 1980, the BOF adopted into regulation a 250 pot limit for the Kodiak Area fishery aimed at reducing effort and improving manageability.

During this period, it became evident to ADF&G that the pot surveys did not adequately assess the Tanner crab stocks, since survey results did not accurately predict fishery performance. In addition, small Tanner crabs, $\leq 114\text{mm}$ CW, did not appear to enter pots in predictable numbers from survey to survey; thus, little could be determined regarding future recruitment trends. The National Marine Fisheries Service (NMFS) was already using trawl gear in the Bering Sea to assess crab populations. ADF&G began an experimental program to test the possibility of using trawls in the Gulf of Alaska in 1980. This trawl survey was done in conjunction with the traditional pot survey for red king crabs.

Vessel participation increased as the price per pound of live crabs went from \$0.65 to \$1.65 in 1981. Reacting to increased fishing pressure, the BOF adopted regulations in 1983 to designate the South Peninsula and Chignik Districts as a combined super-exclusive registration area. This meant vessels fishing for Tanner crabs in those districts could not fish Tanner crabs elsewhere in the state during that registration year. Additionally, the BOF reduced the Kodiak District pot limit from 250 to 200 pots per vessel.

In February 1984, a federal judge issued a restraining order restricting the State of Alaska from enforcing the super-exclusive area in Chignik and the South Peninsula and the 200 pot limit in Kodiak outside of three miles. The BOF issued an emergency regulation rescinding the pot limit and super-exclusive registration area to make state and federal regulations consistent.

Although the joint FMP was still in effect, there was considerable confusion over enforcement and effective dates of regulations. The FMP had been amended nine times in six years. The NPFMC voted to suspend the implementation of regulations for the Tanner crab FMP in 1986. The FMP was repealed at the request of the NPFMC, effective April 1987. Again, the State of Alaska exercised sole responsibility for the Tanner crab fishery in the Gulf of Alaska.

In 1990, the BOF adopted a new pot limit for Kodiak. This pot limit had a sliding scale that decreased with decreasing harvest projections. The limit ranged from 75 to 150 pots per vessel depending on projected harvest guidelines. As crab stocks and allowable harvest projections decreased, the pot limits reduced the amount of gear on the fishing grounds and made accurate inseason management possible. A pot limit of 75 pots per vessel was established beginning in 1983 regardless of the survey estimate. The harvest primarily came from the Eastside Section during the most recent fisheries (Table 2-4). Due to a progressive decrease in the harvestable surplus of Tanner crabs around Kodiak Area, the commercial fishery has not been open for commercial fishing since 1994.

In 1999, ADF&G presented the BOF with a comprehensive harvest strategy for Tanner crabs in the Kodiak Area. The harvest strategy established thresholds of abundance that must be estimated by a preseason trawl survey, for a commercial Tanner crab fishery to occur (Urban et al. 1999). The harvest strategy also requires additional criteria to be in place for an opening of commercial Tanner crab in the Kodiak Area. Other management measures, largely the product of public input at the BOF meeting, resulted in a revised stair-step pot limit for the Kodiak Area of 30, 40, or 60 pots per vessel depending on guideline harvest level (GHL) size and restrictions on the hours that gear can be operated. The harvest strategy, as adopted by the BOF, can be found under 5 AAC 35.507 KODIAK, CHIGNIK, SOUTH PENINSULA DISTRICTS, *C. bairdi* TANNER CRAB HARVEST STRATEGIES in the statewide shellfish regulations (ADF&G 1999).

Stock Status

ADF&G has conducted trawl surveys in the Gulf of Alaska to assess Tanner crab populations since 1980. Legal crab populations have been low or depressed in most areas since 1994. The department has observed and recorded conditions of female egg clutches since the existence of the survey with few abnormalities observed. Successful reproduction is substantiated by the high incidence of one and two-year-old crabs captured in the trawl survey. Food habit studies conducted in the Gulf of Alaska indicate that *C. bairdi* are a significant portion of the diets of Pacific cod *Gadus macrocephalus* and Pacific Halibut *Hippoglossus stenolepis* (Yang and Nelson 2000). Food habit studies also confirm that arthropods and mollusks, a primary food source for Tanner crabs, (Jewett and Feder 1982) are a large portion of many groundfish diets (Yang and Nelson 2000). These studies add validity to the suspicion that fish predation on small crab and competition for food from groundfish are among the major factors limiting Tanner crabs from recruitment to legal size. Additionally, a well documented warming of the air, surface, and sub-surface temperature occurred in the North Pacific after the 1970s (Loy 1999). The full implications of this regime shift in terms of an ecosystem impact have not been fully researched, however, observations have illustrated that many shellfish species declined in abundance while several fish species increased in abundance surrounding the temperature change.

The 1999 trawl survey completed 231 tows in the Northeast, Eastside, Southeast, Southwest, Westside, and North Mainland Tanner crab Sections. The estimated Tanner crab population was 48.62 million crabs in 1999, only a slight decrease from 48.64 million crabs in 1998. The number of prerecruit males (<70 mm CW) increased in 1999, while crabs greater than 70 mm CW slightly decreased (Worton 2000). Of 22,368 male Tanner crabs captured, 2,974 were legal-sized animals. This resulted in a population estimate of 2,309,240 legal crabs, an increase from the 1998 estimate of 1,676,393 crabs. The highest densities of legal male crabs were found in the Eastside Section (Figure 2-2).

Based on the management plan implemented in 1999, the Eastside and Northeast Districts were above one-half the long-term average abundance, however, the Kodiak Management District did not open during the 1999 season as the management strategy requires the population level to be above threshold for at least two consecutive years. Complete information on trawl survey results is available in the ADF&G Regional Information Report series.

DUNGENESS CRAB

Introduction

The Kodiak District for Dungeness crab are the waters of Registration Area J south of the latitude of Cape Douglas (58° 51' 06" N lat.), west of the longitude of Cape Fairfield (148° 50' 15 W long.) and east of the longitude of Cape Kumlik (157° 27' W long.). Part of the Kodiak District, north of the latitude of Boot Point east of the island and north of Cape Ikolik west of the island, has a regulatory season that is open from May 1 until January 1 (Figure 2-3). District waters south of Boot Point and Cape Ikolik, including Alitak Bay and Tugidik Island, have a regulatory season from June 15 until January 1.

Historic Background

Dungeness crabs were first harvested commercially in the Westward Region in 1962 when 1.9 million pounds were harvested from the Kodiak District (Table 2-5). Over the next decade, harvest continued to increase in the Kodiak District, reaching the record harvests of 6.8 million pounds in 1968. Harvest declined through the 1970s as both stock levels and market value for Dungeness crabs decreased (Jackson 1997). Minor increases in recruitment led to slight increases in harvest from the Kodiak District during the late 1970s.

Prior to 1977, the Dungeness fishery was open year round. Closures were first implemented by the BOF from January 1 to April 15 when fishermen were unable to operate effectively due to winter storms. This season change was aimed at reducing the amount of gear fishing with extremely long soak times. Some gear had been left out fishing all winter. The April 15 opening date was set for the south end of Kodiak to avoid high incidences of female red king crabs bycatch in Dungeness gear.

During the early 1980s, declines in abundance of other commercially harvested Alaskan shellfish occurred and created a void in markets that still demanded crab. This led to an increase in both effort and harvest of Dungeness crabs in the Kodiak District. A harvest of 5.6 million pounds occurred in the 1981/82 Kodiak fishery. Effort peaked in 1985 when 125 vessels participated in the Kodiak Dungeness fishery. Many of the post-recruit crabs were removed from the district, resulting in lower yields through the middle of the 1980s (Jackson 1997). In 1987, stocks experienced increasing recruitment that provided the bulk of the harvest through 1990.

The Kodiak District fishery has been prosecuted primarily on recruit crabs, new-shell male Dungeness crabs from 165mm –193 mm CW (Figure 2-4). The fishery has experienced years of lower harvests corresponding to fluctuations in recruitment. Decreased fishery production has also been a product of reduced effort. Participation decreased from 64 vessels in 1990 to only 11 in 1998.

Another significant factor limiting interest and effort in the Kodiak District Dungeness crab fishery during the 1990s was a lower market value. The toxin causing paralytic shellfish poisoning (PSP) was documented in the viscera of Dungeness crabs. The Alaska Department of Environmental Conservation (DEC) placed restrictions on the sale of live and whole cooked crabs beginning in 1992. Prices paid for Kodiak Dungeness crabs dropped from \$1.37 per pound in 1991 to \$0.86 per pound in 1992 after the DEC restrictions took effect. Prices have fluctuated widely since. Price per pound reached a high of \$2.05 in 1997, although Kodiak fishermen have received lower than average exvessel value when compared to other areas in Alaska or the west coast of the lower 48 states. This trend has been dissipating in recent years as prices paid for Kodiak Dungeness crab have been within \$0.10 per pound of the west-coast average (PSMFC 1998).

1999 Fishery

The 1999 fishery opened on May 1 in all areas except Kodiak's south end, which opened on June 15. Eighteen vessels operated in the 1999 Kodiak District Dungeness fishery harvesting 550,568 pounds from 70 landings (Table 2-5). The 1999 harvest and effort in the Kodiak District are the

third lowest in the history of the fishery. A range of vessel sizes participated in the 1999 fishery, with nine vessels between 40-60' overall length comprising half the fleet (Table 2-6).

Very little effort occurred in the Kodiak District during May. One operator made a landing and many fishermen began placing gear on the fishing grounds. The largest amount of effort and harvest occurred in August, followed by September, July, and October (Figure 2-5). Harvest was minimal during November as the majority of the vessel operators participating had quit or were winding down operations for the year. No landings occurred in December. The majority of harvest during 1999 came from the Eastside Section (Table 2-7). This represents a shift in the historic production areas and, presumably, abundance patterns as the Southeast Section has historically produced the largest catches.

An average of 4.2 legal crabs per pot was landed for the 1999 fishery, an increase over the past two seasons. Catch per unit effort (CPUE) is typically highest in the late summer months. The 1999 CPUE was highest in August and October with an average of 5.5 crabs per pot (Figure 2-5).

Exvessel value was slightly higher in 1999 than in 1998. Price paid per pound in 1999 averaged \$1.57, up from \$1.41 paid in 1998. This resulted in a fishery value of \$862,000. Although this represents a 50% increase from 1998, it ranks among the lowest Kodiak commercial Dungeness crab fishery values recorded since the early 1970s.

Stock Status

Mean carapace widths for Dungeness crabs harvested in the Kodiak District were 175mm CW, 173mm CW, and 173mm CW for the 1997-1999 seasons. Recruitment to the fishery has been sufficient to hold stocks at stable levels for the past few years. Dockside data also suggest that recruit class failure in any given year would have significant impact on the commercial fishery.

During the course of interviews conducted with fishermen, many remarked that sublegal males and females laden with full egg clutches have constituted a large portion of the catch. Additionally, many of the crabs harvested in the months of August through November, when CPUE was at its highest, were described by fishermen as recent recruits to the fishery. This anecdotal evidence suggests next season could be similar to 1999.

KING CRAB

Introduction

The Kodiak Registration Area for king crabs are the waters of Registration Area J south of the latitude of Cape Douglas (58° 51' 06" N lat.), west of the longitude of Cape Fairfield (148° 50' 15 W long.) and east of the longitude of Cape Kumlik (157° 27' W long.). The Kodiak Area is further subdivided into five districts for king crab management.

Red King Crab

Historic Background

Beginning in 1936, small amounts of red king crab *Paralithodes camtschaticus* were landed in Kodiak, but catches were not officially recorded until 1950. This period in the history of the fishery was exploratory in nature with fishermen developing gear, locating commercially harvestable quantities of crab, and developing markets for product.

During the exploratory period, the federal Bureau of Commercial Fisheries (now National Marine Fisheries Service) was the management agency. Regulations in effect during this period provided for retaining only males with a minimum carapace width (CW) of 5½ inches. In 1949, the size limit was increased to 6½ inches CW.

King crab landings totaled 60,000 pounds in 1950 and the fishery was becoming a major force in the economy of Alaska. From 1950 to 1959, the catch increased from 60,000 to 21 million pounds. In addition, in 1959, pots and ring nets were classified as the only legal gear and a pot limit of 30 pots per vessel was established for Kodiak. When Alaska gained statehood, management authority was transferred to ADF&G.

In 1960, the king crab season was opened year around. Eight processors bought 21 million pounds of king crab at 8 cents per pound from 143 vessels (Table 2-8). In 1961, ADF&G recommended that more research was needed to determine the stock structure, breeding habits, ages, and size at maturity before effective conservation regulations could be instituted. In 1963, the minimum legal size limit was increased to 7 inches CW based on Kodiak area growth rate studies. These studies concluded that a 7 inch CW size limit would allow mature male king crab to breed at least one year before being available to the fishery. In 1965, the 30 pot limit was repealed. A newshell crab closure went into effect from May 1 to June 30 (Table 2-9). ADF&G had completed king crab tagging studies and had defined four separate stocks of crab. Also in 1965, the staff reports to the Alaska Board of Fish and Game (later split into one board for game and one board for fisheries) stated that the stocks could not continue to support the large harvests that were occurring. ADF&G staff recommended the implementation of a quota system to curtail the harvest, however, the board did not act.

The development period which began in 1950 peaked in 1966, when 177 vessels delivered 90 million pounds to 32 processors in a ten-month fishing season. In 1966, ADF&G issued the first emergency order to protect newshell and breeding crab and added its first shellfish management position to the staff. After examining 12,000 female king crabs, of which only three to five percent were barren, ADF&G stated that Kodiak king crab stocks were biologically sound. It appeared that a sufficient number of males were present to mate most of the females.

From 1967 to 1970, the king crab fishery expanded to offshore areas in an attempt to maintain the catch levels of previous years. In 1967, ADF&G started a test fishing program to locate concentrations of prerecruit crabs and to estimate future production. The first catch projections predicted a continuing decline in future catches. The 1967/1968 season catch dropped to 43 million pounds, 30 million pounds less than the prior year. Also in 1968, mature females examined from eight different areas showed that 16% were not carrying eggs.

During the 1968/1969 season, the catch dropped to 18 million pounds and the fishery was closed by emergency order on February 28. ADF&G determined that in areas with an intensive commercial harvest, there was a higher incidence of barren females. In some areas, 25% of the females were barren, with a higher proportion of large females barren than small females. The fishery was still dependent on a weak recruit class.

In July 1970, the Alaska Board of Fish and Game instituted a pot limit of 60 pots per vessel and established a catch quota system. ADF&G was directed to institute surveys for abundance estimates. The goals of the policy were twofold:

1. To develop and establish a stable fishery, with the objective of eliminating fluctuating harvests characteristic of the fishery.
2. To develop and maintain a broad base of various age classes in order to insure breeding success.

By 1972, the decline had been reversed and harvests started increasing. The 1973 fishery lasted 10 days under a fixed quota system and the Southern District was reopened for an additional eight day fishery.

In 1974, the BOF adopted an 8-inch CW minimum size limit for a second season, as proposed by the Kodiak Fish and Game Advisory Committee (KAC). Since it was indicated that an increase in harvest could be made, the BOF took a cautious approach and decided to increase exploitation on the older postrecruit crab. The BOF also adopted a flexible system of harvest guidelines rather than fixed quotas. The BOF directed ADF&G to continue to manage the fishery using a multi-age-class management strategy based on analysis of crab stocks.

The harvest guideline system provided a more liberal approach to the harvest strategy. During the 1975/76 fishery, ADF&G tried to maximize the harvest within each district by dividing districts into schools and closing each school when a 33% fishing mortality was reached (based on in-season tag recoveries).

In 1978, the BOF lowered the minimum size limit of the second season from 8 inches to 7½ inches CW. ADF&G proposed the change because of the large amount of postrecruit crab available between 7½ and 8 inches that year. The 1978/79 second season recorded a harvest of 1.7 million pounds; similar to the 1.8 million pounds landed in previous years. The lowered size limit increased recruit harvest during the second season from less than one percent under an 8 inch size limit to 15 percent the first year it was in effect. In 1979, the BOF increased the pot limit to 100 pots per vessel. The BOF adopted a management plan for Kodiak in 1981. The plan's direction was threefold:

1. Individual stocks of crabs are to be managed as a single unit, and small closures that leave a portion of a stock open should be avoided;
2. Utilization of stocks should be based on overall stock size while considering recruit and postrecruit population levels;
3. A second season for 7½-inch crab will be provided with an opening between November 15 and December 15.

In addition, in 1981, the BOF increased the pot limit to 150 pots per vessel. The 1981/82 season harvest was the highest of the previous 14 years at 24.2 million pounds. The 1982/83 season total harvest declined to 8.7 million pounds, the lowest in 24 years. However, the value of the fishery was the second highest, worth \$32.7 million. The effort level for this fishery was also the highest on record with 309 vessels participating.

In 1983, ADF&G did not open the red king crab fishery due to poor stock condition. This was a result of poor recruitment to legal-sized animals for the previous two years combined with continued low recruitment forecast for the next three years. The population of adult male crabs was the lowest recorded in 13 years of annual population assessments. ADF&G established threshold levels of legal males needed before considering any future fishery openings. The threshold of 10.3 million pounds of legal crabs was nearly twofold the 5.5 million pound estimate of the 1983 survey. Additionally in 1983, the BOF lowered the pot limit to 100 pots per vessel.

In 1984 and 1985, the estimate of legal males on the pot survey remained below the 10.3 million pound threshold level established for Kodiak Island. However, in 1985 the estimate of legal males in the Southwest District was 4.9 million pounds. This was above the threshold value of 3.4 million pounds of legal crab established for the district. ADF&G proposed a 450,000 pound harvest and presented this proposal to the Kodiak Advisory Committee. After review of both department and industry views, the KAC voted unanimously to oppose a fishery in the Southwest District. Their concerns were that a small area open with a large effort level would be destructive to the reproductive potential of the stock. The commissioner of Fish and Game acknowledged the KAC concerns and the Kodiak king crab fishery was closed during 1985.

In 1986, the fishery again remained closed as the estimate of legal males was below threshold values. ADF&G revised the management plan from a threshold of legal males needed for a fishery to a number of fertilized females needed to maintain maximum reproductive potential of the stocks when populations are depressed. This threshold value for the Kodiak Area is 5.1 million fertilized female red king crabs.

In 1987, a trawl survey was conducted throughout the management area for the first time to assess both red king and Tanner crab stocks. Previous ADF&G trawl surveys had been limited to Tanner crab assessment in Shelikof Strait and in portions of the Northeast and Eastside Sections of Kodiak Island. Offshore areas of Chignik and Pavlof Bay in the South Peninsula had also been surveyed. This trawl survey estimated a population of 310,000 adult female red king crab around Kodiak of which 47% were not carrying egg clutches. Additionally the estimate of legal males was 177,000 crabs, the lowest estimate in the history of the survey. The 1987 survey results indicated a continuation of the decline in red king crab abundance that had been noted the past five years and the commercial fishery again remained closed.

From 1988 to 1998, ADF&G conducted trawl surveys to assess king and Tanner crab populations around Kodiak Island, along the Alaska Peninsula, and around the Eastern Aleutian Islands. The Kodiak Area continued to remain closed because the abundance estimates of females were well below threshold levels. Complete information on the Westward Region trawl survey catches can be obtained from ADF&G in a series of Regional Information Reports.

The pot limit for commercial king crab fishing in the Kodiak area was reduced in 1993. A sliding scale of 25-75 pots per vessel was selected based on the projected harvest guideline. Although a

fishery had not occurred in the prior 10 years, this public proposal was aimed at reducing effort when the fishery did reopen.

Stock Status

The Kodiak red king crab population remains at historically low levels, and fishing seasons for this species have remained closed since 1983. During the 1999 Kodiak trawl survey, ADF&G completed 231 hauls in known crab habitat. The red king crab population was estimated to be 93,285 animals, of which 35,255 were legal-sized males. The majority of king crabs were found in the Northeast Section (Figure 2-6). The mature red king crab female population was estimated to be 28,211 animals. Only 25% of the mature female crab sampled had an estimated ovigerity of 80% or greater indicating a continued depressed population status. The decrease in both female and males in all crab sizes contributed to the decrease in the overall population estimate from 1998.

Golden King Crab

Interest in harvesting golden or brown king crab *Lithodes aquespinus* grew following the collapse of the red king crab stocks. Although golden kings were occasionally landed with red king crab in prior years, the first recorded landings occurred in 1983. In that year, 12 vessels explored around Kodiak Island finding limited resources. The catch totaled 111,398 pounds from 36 landings (Table 2-10). The largest harvest from this fishery totaled 146,478 pounds taken in 1986.

Management of the golden king crab fishery in Kodiak is guided by conditions of a permit issued by the commissioner. Fishers may use only 75 pots that may not be longlined. Additional requirements of the permit include restrictions on minimum fishing depth and a fishing logbook requirement. The minimum legal size for golden king crab in Kodiak was reduced by the BOF from 7-inch CW to 6 1/2 inches CW in 1985.

Since 1988, no more than two boats have participated in this fishery annually, resulting in confidential catch information. Average harvest from those years has been less than 1,600 pounds. During most years, there has been no activity at all. No vessels registered in 1999. ADF&G does not assess golden king crab stocks in the Kodiak Area.

SHRIMP

Trawl Fishery Historic Background

The Westward Region shrimp fishery began with a harvest of 31,886 pounds in 1958. The fishery grew rapidly to an annual catch of near 11.0 million pounds in the early 1960s. The fishery slowed when shore plants and the fishing fleet were badly damaged by the 1964 earthquake and tidal wave, but then quickly surged to a peak Kodiak District harvest of 82.2 million pounds in 1971 (Table 2-11). As Kodiak shrimp catches declined in the 1970s, much of the vessel effort shifted into the Chignik and South Peninsula Districts. The Westward Region harvest peaked in 1976 at 120 million pounds. Stock abundance and fisheries declined sharply thereafter. The northern pink shrimp

Pandalus borealis has predominated the harvest contributing over 95% by weight. Other species landed included sidestriped *Pandalopsis dispar*, coonstripe *Pandalus hypsinotus*, spot *Pandalus platyceros* and humpy *Pandalus goniurus* shrimps.

No regulatory measures were promulgated in the Kodiak shrimp fishery until 1970 when an egg hatch closure was enacted during March and April for some bays and nearshore areas. In 1971, a quarterly quota system was adopted to provide harvest throughout the year while not allowing unrestricted harvest. In the late 1970s, the quarterly quota system was reduced to a single opening for certain areas and staggered opening dates for many of the fishing sections, while others retained two fishing periods in fall and winter. Most of the adjustments to season dates were due to industry's desire to spread harvest over a longer time period while trying to prevent conflicts with vessels and processing in other fisheries. In addition, during the late 1970s, stocks in some areas were not large enough to support fisheries, and these areas were opened and closed by emergency order.

ADF&G initiated a voluntary logbook program in 1967. The resulting database, plus data from trawl surveys conducted by ADF&G since the early 1970s, provided a means for establishing harvest levels. The system was flexible during its development stage, but in 1981, the industry requested this management scheme be defined and adopted into regulation. This led to the *Westward Region Shrimp Management Plan*, which was approved by the BOF in 1982. The objectives of this management plan were to maintain shrimp stocks at a level termed "representative biomass index" (RBI) determined by survey trawls, while allowing a fishery during rebuilding periods. A minimum level at which any harvest would occur was established and termed the "minimum acceptable biomass index" (MABI).

Concurrent with approval of the *Westward Region Shrimp Management Plan*, the BOF also enacted an additional management strategy as an "economic alternative" known as the *Mainland Shrimp Management Plan*. This alternative strategy allowed shrimp fishing in some bays on the Alaska Peninsula and around Afognak Island regardless of survey results. In September of 1997, the BOF repealed the *Mainland Shrimp Management Plan* due to concerns about the lack of information needed for the sustainability of the fishery. This left only the General Section comprising offshore areas open annually from June 15 through February 28 (Figure 2-7).

The General Section has no assessment surveys conducted nor is there any established MABI. ADF&G requires logbooks for vessels registering in the General Section to provide fishery information for management and research. There has been little commercial harvest effort in the General Section in the past decade, with no effort in most years. The highest harvest in that time has been 11,905 pounds, landed in 1997/98 by four vessels.

1999/2000 Fishery

Three vessels registered for the shrimp trawl fishery in the General Section in 1999/2000. Eight landings were made with a total harvest of 5,865 pounds. Over 90% of the shrimp harvested were pink shrimp with the remaining percentage being composed of sidestriped shrimp. The majority of the 1999/2000 shrimp harvest was sold unprocessed off the docks in Kodiak. Fishermen verbally reported prices of up to \$3.00 per pound for dockside sales to the public.

Status of Status

ADF&G has continued to survey shrimp stocks from some essential historic areas of production on a triennial basis (Table 2-12). A survey was conducted in September and October of 1998, with the next survey scheduled to occur in 2001. A total of 68 stations were sampled around the Kodiak archipelago and along the Alaska mainland. The 1998 survey, like the previous survey in 1995, caught shrimp over a widely scattered area but at very low densities. The largest concentrations were found in the deepest stations, generally over 90 fathoms, where Pacific cod, walleye pollock, and some species of flatfish populations known to be significant predators of pandalid shrimp (Yang and Nelson 2000) were lower than average. Additionally, water temperatures at trawl depth in the deeper stations were found to be colder and more in the range needed for optimal reproduction, egg production, and larval survival of pandalid shrimp (Ruccio 1999).

Marmot Bay, which had shown some increase in abundance in the 1995 survey at an estimated 2.84 million pounds of shrimp for the area, declined in the 1998 survey to 1.10 million pounds of shrimp. Other surveyed areas showed only marginal increases or decreases. Recovery of shrimp stocks in the Kodiak area to populations large enough to permit large-scale commercial fisheries is not anticipated in the near term. Complete information on the Westward Region shrimp trawl survey catches can be obtained from ADF&G in a series of Regional Information Reports.

Pot Shrimp Fishery

Pot fishing for shrimp has never been a large fishery in Kodiak and is virtually nonexistent in the rest of the region. The West and North Afognak Sections, along with the Mainland Section, were closed to pots and trawls by the 1997 BOF actions contained in 5AAC 31.590 WESTWARD AREA SHRIMP FISHERIES MANAGEMENT PLAN. In all other areas, shrimp may be taken year round with pots. ADF&G requires a logbook to be submitted with fishtickets from all landings of pot caught shrimp. The largest landing of product was less than 19,000 pounds of spot shrimp tails in 1983 (Table 2-13). Two vessels registered to pot fish for shrimp in 1999, but no landings were reported.

SEA CUCUMBER FISHERY

Historic Background

Red sea cucumbers *Parastichopus californicus* were not harvested commercially in the Westward Region until 1991. In 1991 and 1992, processors recruited divers to gather small numbers of red sea cucumbers in the Kodiak and Chignik areas to test marketability. In the spring of 1993, several processors gathered divers to prosecute a commercial fishery for red sea cucumbers in those same areas. The fishery was allowed to develop under the terms of a permit authorized by 5 AAC 38.062 of the ADF&G Commercial Shellfish Regulations. ADF&G specified dive gear as the only legal gear and required dive logs to be submitted with fish tickets. Each diver was required to have a CFEC interim use permit card. Harvests were monitored to determine abundance and distribution. As the harvest reached levels where ADF&G felt there

was a potential for overfishing, the various fishing areas were closed. The 1993 harvest of 564,516 pounds was taken by 50 divers (Table 2-14).

In February of 1994, ADF&G announced several management measures intended to prevent overharvest of the red sea cucumber resource. A seasonal closure from May 1 through September 30 was established to protect the spawning aggregates of red sea cucumbers. In addition, guideline harvest levels were established for the Kodiak and Chignik Districts. A total of 200,000 pounds was announced for Kodiak with the Chignik GHL set at 50,000 pounds. Management areas based on the Tanner crab fishing sections were utilized in Kodiak in an attempt to spread the effort and harvest around the island and prevent localized depletions (Figure 2-1). A GHL was set for each of the individual areas based on historic production and fisheries performance. Registration permit provisions included a weekly fishing period of 5 days and daily dive logs submitted by the divers with their fish tickets and the fishery was reopened April 1.

Following the May 1 to September 30 closure, ADF&G reopened the Westward Region to red sea cucumber fishing. Guideline harvests for the Kodiak and Chignik Districts totaled 225,000 pounds with 3 day weekly fishing periods. The shortened fishing periods were set to allow ADF&G a better opportunity to assess inseason fishery performance. GHLs were quickly reached in the sections surrounding Kodiak Island, but the Mainland and Chignik Sections received little effort and remained open for the duration of the established season.

The 1995/1996 sea cucumber fishing season opened on October 1, 1995. Evaluation of another year of fishery performance resulted in a decreased guideline harvest level. The GHL for the Kodiak and Chignik Districts was set at 160,000 pounds. Effort again concentrated on the Eastside, Southeast, Southwest and Westside Sections of Kodiak. Although outlying areas along the Alaska Peninsula have historically remained open for the duration of the regulatory season, divers were reluctant to cross the Shelikof Strait in the face of stormy weather and the expectation of marginal returns. Since the 1996/97 season, the fishery has followed a similar pattern of approximately five fishing periods of varying length occurring before the areas around Kodiak Island obtained their respective GHLs and were closed for the season.

1999/2000 Fishery

The season opened on October 1, 1999 with a GHL for the Kodiak and Chignik areas of 150,000 pounds. The Kodiak Area was further subdivided into sections with individual GHLs. Management strategy was the same as previous years with a three-day open period per week, and dive logs required with each fish ticket.

During the first fishing period, October 1-3, eighteen divers participated with nearly all of the effort concentrated in the Eastside and Southeast Sections. Ten divers in the Eastside Section harvested 17,971 pounds, less than half of the 40,000 pound GHL. Five divers in the Southeast Section harvested 16,629 pounds and three divers harvested 6,449 pounds from the Westside Section. Historical harvest patterns suggested that the majority of effort for the next opening would be concentrated in the Southeast Section. A determination was made to open that section for one day to prevent exceeding the 25,000 pound GHL. The Eastside and Westside Sections would remain open during the next full three-day fishing period of October 8-10.

During the second fishing period, 25 divers made landings with most effort concentrated in the Southwest and Eastside Sections. Harvest also occurred in the Southeast and Westside Sections. A total of 38,597 pounds were harvested in the second fishing period. Six divers harvested 16,147 pounds from the Southwest Section. During the second fishing period, six divers harvested 14,210 pounds from the Eastside Section bringing the cumulative total to 32,181 pounds for the season. The Southeast Section did not receive a large amount of participation as four divers harvested 5,466 pounds from the section bringing the cumulative total to 22,095 pounds. Three divers harvested 2,774 pounds from the Westside Section. Based on the harvest that occurred during the second fishing period, the Southeast Section was to be closed for the remainder of the season. The Southwest Section would close after one day and the Eastside Section after two days in the third fishing period, October 15-17.

Effort in the third fishing period was concentrated in the Westside Section, with some harvest occurring in the Northeast and Eastside Sections. Twelve divers harvested 21,023 pounds in the Westside District, bringing the cumulative total to 30,246 pounds for the 1999/2000 season. The Westside District GHL of 30,000 pounds had been met, so the section was closed for the remainder of the year. During the two-day opener in the Eastside Section, five divers harvested 7,450 pounds. The Eastside Section cumulative total was 39,631 pounds, slightly under the 40,000 pound GHL. However, the section was closed for the remainder of the 1999/2000 season to prevent exceeding the GHL. In the Northeast Section, three divers harvested 1,670 pounds. The Southwest Section was open for two days and the Northeast Section for one day in the fourth fishing period, October 22-24. A large portion of the divers participating in the fishery quit fishing after the third opener.

In the fourth fishing period, seven divers harvested 2,764 pounds in the Northeast Section. It was announced that the Northeast section would not reopen as the GHL of 5,000 pounds had been taken. With the vast majority of reasonably accessible and productive areas closed for the year, most divers quit for the season.

Because very few divers were participating in the fishery and there were approximately 3,000 pounds to be harvested in the Southeast Section, it was decided to reopen the Southeast for an additional fishing period to afford harvesters opportunity to obtain the GHL. This resulted in a fifth fishing period from October 29-31. Three divers harvested 3,581 pounds in the period. The Southeast Section was then closed for the remainder of the 1999/2000 season.

All registered participants in the sea cucumber fishery had quit for the season after the October 31 fishing period. Sections in the Kodiak District had been open to commercial fishing from 4-15 days total for the season. No harvest occurred in the North Mainland or Chignik Sections during the 1999/2000 season. The total harvest of red sea cucumbers taken from the Kodiak District during the 1999/2000 season was 116,134 pounds (Table 2-15). No additional landings occurred throughout the winter and spring of 1999/2000. The sea cucumber season closed by regulation on April 30, 2000.

Stock Status

There are no population estimates for red sea cucumbers in the Westward Region. Following the establishment of conservative GHLs in 1995, catch rates estimated from diver logbook data in

the commercial fishery have remained stable in recent years indicating a stable population. Actual biomass levels, especially at depths unavailable to divers, are unknown.

SEA URCHINS

Historic Background

The green sea urchin *Strongylocentrotus droebachiensis* was not harvested commercially in the Westward Region until 1980 when a small amount was taken in the Kodiak area to test marketability. There was little further interest in green sea urchins in Kodiak until 1985 when a small harvest occurred. In 1986, the harvest increased with more divers participating. Peak harvest occurred in 1988 at 190,500 pounds (Table 2-16). Green sea urchins are usually shipped live to Japan for processing.

Red sea urchins *Strongylocentrotus franciscanus* are widely harvested in Southeast Alaska and along the west coast of Canada and the lower 48 states. Red sea urchins are found in extremely small quantities in the Kodiak Area. Their number is insufficient to support a commercial venture.

Fishermen participate in the green sea urchin fishery under the terms of a miscellaneous shellfish permit as authorized in 5 AAC 38.062. Commercial fishing regulations set the season at October 1 to January 31. While marketable roe may be available in at other times of the year, the potential is high for increased sorting and handling mortality of unmarketable green sea urchins. ADF&G in Dutch Harbor has issued special exploratory permits during the summer and early fall for the Eastern Aleutians to check the quality of the roe but divers have found little marketable product during these periods.

Action by the BOF in March of 1997 authorized the use of 4-foot rakes for taking urchins, but the BOF re-affirmed its opposition to the use of pots in the urchin fishery. Pot gear could result in unacceptable handling mortality of unmarketable green sea urchins. Enforcement concerns had also been raised for pot gear. The prime green sea urchin season coincided with the historical Tanner crab fishery and it was feared that under the guise of green sea urchin pot fishing, fishermen could prospect for Tanner crab. There are currently no size limits for green sea urchins in regulation. However, buyers will only purchase green sea urchins two or 2¼ inches or greater in diameter at this time.

1999/2000 Green sea urchin Fishery

One diver registered on multiple vessels to harvest green sea urchins in the Kodiak Area during 1999/2000. The diver also acted as the fisheries only processor, shipping live product to Japan for sale. All harvest information is confidential because fewer than three divers or processors participated in the fishery. As has been typical in recent years, although the sea urchin and sea cucumber seasons both open on October 1, interest in urchin harvesting occurred only after the Kodiak Island waters closed to sea cucumber harvesting.

Stock Status

No assessment work is currently being done on green sea urchin populations in the Westward Region. The sole fishery participant this year worked extensively with ADF&G to ensure that deliveries were sampled before shipping. In addition to determining the spawning condition, roe content, and test diameter, structures (e.g. rotules, components of Aristotle's lantern) were collected from urchins for a recently developed aging technique. Given the low effort levels in the fishery, data from logbooks on CPUE varies widely and does not lend itself to inferences on stock status. Fishery information indicates the biomass is not large when compared to other areas on the Pacific Coast and when compared to an annual worldwide sea urchin harvest estimated at 100 million pounds (Lourie and Sanders 2000).

OCTOPUS

Introduction

The giant Pacific octopus *Octopus dofleini* exists throughout Alaskan waters and is abundant in the Kodiak District. Most recorded catches have been incidental to other commercial fishing activities with the majority being taken in pot gear and less frequently by bottom trawl fishing.

Historic Background

Octopus is considered a groundfish species by National Marine Fisheries Service (NMFS) and a shellfish species under ADF&G management classifications. Before 1984, no distinction was made between state and federal waters regarding octopus harvest. In the period from 1977 to 1984, the highest recorded harvest was 19,342 pounds taken from the Kodiak Area in 1980 (Table 2-17).

The octopus fishery experienced a dramatic increase in the 1990s. The decline of many crab stocks in the Gulf of Alaska resulted in reduced harvest opportunity or fishery closures for many of the crab fisheries that had been prosecuted from late fall to early spring with pot gear. To fill the void, many pot fishermen turned to Pacific cod in those months. ADF&G worked with industry to ensure that all octopus harvest, particularly that not sold but retained as bait, was documented on fishtickets. ADF&G also began requiring vessels to specify, at the time of registration for groundfish fisheries, their intent to retain octopus as bycatch. Octopus had long been sought after as bait in the Pacific halibut longline fisheries and is being used extensively in the Pacific cod pot fisheries as bait. Periodic episodes of favorable market conditions also resulted in large amounts of octopus sold to processors. In some years, such as 1990, the average exvessel price per pound was \$1.08.

The majority of octopus harvest since 1985 has occurred within state waters (Table 2-18). In 1991, 107,030 pounds of octopus were harvested from state waters in the Kodiak Area. In that same year, 27,936 pounds of octopus were harvested from federal waters in the Kodiak Area. Octopus harvest decreased substantially in the middle of the 1990s, only to increase sharply with the advent of the state managed Pacific cod fisheries in 1997. In 1997, a total of 238,954 pounds of octopus were harvested in state and federal waters. Approximately 80% of the 1997 harvest came from state

waters. Harvest reached an all time high in 1998 with a combined state and federal harvest of 326,070 pounds.

1999 Fishery

Fifty one vessels made 336 landings for a total harvest of 172,869 pounds from state waters in the Kodiak Area during 1999. Thirty nine vessels harvested 53,427 pounds of octopus from 178 landings from federal waters of the Kodiak Area. Many of the fishtickets submitted indicated octopus were being retained for use as bait; those tickets with a price per pound listed an average of \$0.40 for an exvessel fishery value of \$90,518 for the state and federal water harvest combined.

Stock Status

ADF&G does not currently assess octopus populations in the Westward Region.

RAZOR CLAMS

Historic Background

The Alaska razor *Siliqua alta* and Pacific razor *Siliqua patula* have been harvested in the Kodiak Management Area since the early 1920s. Though many Kodiak Island beaches were explored with some success, the principal commercial harvest occurred about 70 miles northwest of Kodiak in the Kukak Bay, Hallo Bay, Big River, and Swikshak Beach regions of the Alaska Peninsula. Digging continued on a somewhat regular basis until the early 1960s when a combination of increasing federal and state clam processing regulations, poor market conditions, and the 1964 earthquake precipitated a decline in harvests. Commercial harvesting of clams for human consumption has never become re-established and the fishery has been strictly hand digging for use as bait in the Dungeness crab fishery. The certification program conducted by the Alaska Department of Environmental Conservation (DEC) ended in July 1980. Currently, there are no clam beaches in the Kodiak Area certified as safe for human consumption due to the threat of paralytic shellfish poisoning.

Many of the principal harvest areas along the Alaska Peninsula are adjacent to the Katmai National Monument, which includes all the land above mean high water from Cape Douglas to Cape Kubugakli. Commercial activity within the monument is restricted by the current policy of the U.S. Park Service that dictates a ban on camping in the monument in support of a business enterprise.

In 1986, the BOF adopted a regulation prohibiting hydraulic mechanical dredges from harvesting clams in the Kodiak Area east of Kilokak Rocks.

Stock Status

The potential for a razor clam harvest in the Kodiak Management Area has been established by historic catch records and studies conducted by ADF&G. These studies, however, were conducted in the mid 1970s and are of little benefit in judging stock status at this time. There were no landings

of clams from the Kodiak Area during 1999 (Table 2-19). Recent information from sport harvesters indicates that a change has occurred in the substrate structure of the beaches of Kukak Bay and Swikshak Beach. Reports indicate that beaches have eroded considerably resulting in a loss of productive habitat.

LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game) 1999. Commercial Shellfish Regulations, 1999-2000 edition. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.
- Jackson, David R. 1997. Westward Region Commercial Dungeness Crab and Shrimp Fisheries: A Report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report, 4K97-9, Kodiak.
- Jewett, S. C., and H. M. Feder. 1982. Food of the Tanner Crab *Chionoecetes bairdi* Near Kodiak Island, Alaska. In: B. Melteff (ed.), Proceedings of the International Symposium on the Genus *Chionoecetes*. University of Alaska Sea Grant, AK-SG-82-10, Fairbanks, p. 293-317.
- Lourie, S. A., and Darla L. Sanders. 2000. IUNC Species Assessment for the Green Sea Urchin *Strongylocentrotus droebachiensis*. McGill University Press.
- Loy, S. 1999. "Gulf of Alaska Small-Mesh Trawl Surveys, 1953-1997." <http://www.fakr.noaa.gov/rawl/index.htm> - start April 1999.
- PSMFC (Pacific States Marine Fisheries Commission) 1998. 51st Annual Report of the Pacific States Marine Fisheries Commission for the year 1998 to the congress of the United States and to the Governors and Legislatures of Washington, Oregon, California, Idaho, and Alaska.
- Ruccio, Michael P. 1999. Trawl Survey of Shrimp in the Kodiak District, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report, 4K99-52, Kodiak.
- Urban, D., D. Pengilly, D. Jackson, I. Vining. 1999. A Tanner crab harvest strategy for Kodiak, Chignik, and the South Peninsula Districts. A Report to the Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Westward Region, Regional Information Report 4K99-21, Kodiak.
- Worton, C. *In Press*. Bottom trawl survey of crab and groundfish: Kodiak Island, Chignik, South Peninsula and Eastern Aleutian Areas. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report, Kodiak.
- Yang, M.S., and M. W. Nelson. 2000. Food Habits of the Commercially Important Groundfishes in the Gulf of Alaska in 1990, 1993, and 1996. NOAA Technical Memorandum NMFS-AFSC-112.

Table 2-1. Landings and values of shellfish fisheries to the Port of Kodiak, 1999.

Species	Pounds ^a	Exvessel Value (Dollars)
Green sea urchins	confidential ^b	confidential ^b
Dungeness crab	550,568	861,919
Bristol Bay red king crab	545,147	1,707,901
Octopus ^c	226,296	90,518
Bering Sea snow crab	208,404	183,396
Sea Cucumbers	116,134	139,361
Shrimp ^d	6,035	18,105
Weathervane scallops	266,012	1,662,575
TOTAL	1,918,596	4,663,775

^a Represents pounds of product landed at the Port of Kodiak including harvest outside the Kodiak Management Area.

^b Less than three vessels or processors participated.

^c Harvest from shellfish and groundfish landings.

^d All species, primarily pink shrimp and sidestriped shrimp.

Source: Alaska Department of Fish and Game fishticket data base, June 2000.

Table 2-2. Shellfish emergency orders issued for the Kodiak Management Area, 1999.

Emergency Order	Effective Date	Explanation
<u>Tanner Crab</u>		
4-S-01-99	January 28, 1999	Closed Kodiak, Chignik, South Alaska Peninsula, Eastern Aleutian Districts to Tanner crab fishing.
<u>Weathervane Scallops</u>		
4-S-09-99	September 6, 1999	Closed the Shelikof District of the Kodiak Area To Weathervane Scallop fishing.
4-S-10-99	September 9, 1999	Closed the Northeast District of the Kodiak Area Weathervane Scallop fishing.
4-S-11-99	September 29, 1999	Closed the Alaska Peninsula District to Weathervane Scallop fishing.
<u>Sea Cucumbers</u>		
4-S-13-99	October 8, 1999	Closed the Southeast District of the Kodiak Area for the 1999 Sea Cucumber fishing season.
4-S-14-99	October 14, 1999	Limited fishing in the Southwest District to 24 hours and limited fishing to 48 hours in the Eastside District of the Kodiak Area for Sea Cucumber fishing.
4-S-18-99	October 22, 1999	Closed the Eastside and Westside Districts for the 1999 season, limited fishing in the Northeast District to 48 hours, and 24 hours in the Southwest District of the Kodiak Area for Sea Cucumber fishing.
4-S-19-99	October 26, 1999	Closed the Northeast District for the 1999 season and limited fishing in the Southwest District to 24 hours in the Kodiak Area for Sea Cucumber fishing.

Table 2-3. Commercial catch and effort for the Tanner crab *Chionoecetes bairdi* fishery for the Kodiak Management District, 1967-1999.

Year	Vessels	Landings	Number of crabs	Number of Pounds	Pots Lifted	CPUE	Average Weight	Price Per Pound (\$)
1967	NA	83	NA	110,961	NA	NA	NA	0.07
1968	NA	817	NA	2,560,687	NA	NA	NA	0.10
1969	85	955	NA	6,827,312	72,748	43	NA	0.11
1969/70	67	833	3,237,244	8,416,782	78,266	42	2.6	0.11
1970/71	82	453	2,686,067	6,744,163	60,967	44	2.5	0.11
1971/72	46	505	3,878,618	9,475,902	65,907	59	2.4	0.13
1972/73	105	1,466	13,609,688	30,699,777	188,158	67	2.3	0.17
1973/74	123	1,741	11,857,573	29,820,899	217,523	59	2.5	0.20
1974/75	74	471	5,459,940	13,649,966	73,826	83	2.5	0.17
1975/76	104	1,168	10,748,958	27,336,909	199,304	64	2.5	0.20
1976/77	102	998	7,830,727	20,720,079	164,213	48	2.6	0.33
1977/78	148	1,483	12,401,243	33,281,472	251,621	49	2.6	0.43
1978/79	218	1,225	10,702,829	29,173,807	275,455	38	2.7	0.55
1979/80	211	1,385	6,813,128	18,623,875	282,946	24	2.7	0.55
1980/81	188	771	4,398,631	11,748,629	174,351	25	2.7	0.65
1981/82	221	950	5,413,467	13,756,159	230,403	24	2.5	1.65
1982/83	348	1,439	7,744,812	18,927,061	377,562	21	2.4	1.25
1983/84	303	1,229	5,891,968	14,478,066	303,764	10	2.5	1.20
1984/85	214	710	4,567,037	12,024,553	176,830	26	2.6	1.50
1985/86	233	601	3,457,930	8,996,151	160,808	21	2.6	1.90
1986/87	189	503	1,830,365	4,833,473	110,963	16	2.6	2.62
1987/88	176	557	1,614,874	3,888,906	101,488	16	2.4	2.40
1988/89	171	567	2,106,320	5,208,999	86,556	24	2.5	3.05
1989/90	233	548	1,435,477	3,456,314	97,333	15	2.4	2.40
1990/91	137	448	764,107	1,917,713	54,110	14	2.5	1.59
1991/92	143	434	982,391	2,400,213	47,384	20	2.4	2.22
1992/93	140	353	518,982	1,318,446	43,528	12	2.5	2.10
1993/94	129	378	510,681	1,252,342	41,527	12	2.5	2.25
1994/95			NO COMMERCIAL FISHERY					
1995/96			NO COMMERCIAL FISHERY					
1996/97			NO COMMERCIAL FISHERY					
1997/98			NO COMMERCIAL FISHERY					
1998/99			NO COMMERCIAL FISHERY					
TOTAL	NA	NA	130,463,057	341,649,616	3,937,541	NA	NA	NA
AVERAGE ^a	162	827	5,218,522	12,201,772	140,626	31	2.6	NA

^a Average of years fished.

Table 2-4. Tanner crab *Chionoecetes bairdi* catch in pounds by fishing section for the Kodiak Management District, 1991/92-1999/2000.

Section	1991/92	1992/93	1993/94	1994/95 through 1999/2000
Northeast	381,512	264,913	238,076	Closed
Eastside	2,018,701	728,191	395,062	Closed
Southeast	Closed	Closed	Closed	Closed
Southwest	Closed	325,342	279,077	Closed
Semidi Islands	Closed	Closed	Closed	Closed
North Mainland ^a	Closed	Closed	340,127	Closed
South Mainland	Closed	Closed	0	Closed
Westside	Closed	Closed	Closed	Closed
Total	2,400,213	1,318,446	1,252,342	-0-

^aNorth Mainland catch includes South Mainland and Semidi Island because less than three vessels participated.

Table 2-5. Dungeness crab *Cancer magister* commercial catch and effort by fishing year for the Kodiak Management District, 1962-1999

Year	Landings	Vessels	Number of Crab	Number of Pounds	Pots Lifted	Average Lbs Per Landing	CPUE	Average Price/Pound	Exvessel Value
1962 ^a	149	NA	NA	1,904,567	NA	12,782	NA	\$0 .09	171,000
1963	354	NA	NA	2,487,512	NA	7,026	NA	0.09	224,000
1964	395	29	NA	4,254,565	NA	10,537	NA	0.09	375,000
1965	351	25	NA	3,311,571	NA	9,434	NA	0.12	397,000
1966	144	12	NA	1,416,174	NA	7,976	NA	0.13	149,000
1967	439	18	NA	6,663,668	NA	15,179	NA	0.13	866,000
1968	536	43	NA	6,829,061	NA	12,741	NA	0.14	956,000
1969	455	29	NA	5,834,628	190,967	12,823	12	0.16	934,000
1970	318	33	-	5,741,438	249,800	18,005	9	0.14	804,000
1971	173	24	515,653	1,445,864	90,913	8,358	6	0.18	260,000
1972	316	34	766,960	2,059,536	140,921	6,517	6	0.40	824,000
1973	487	42	879,484	2,000,526	251,467	4,108	3	0.50	1,000,000
1974	172	23	337,839	750,057	104,062	4,361	3	0.47	353,000
1975	154	15	307,272	639,813	76,411	4,154	4	0.61	390,000
1976	6	4	38,072	87,110	4,410	14,518	9	0.15	13,000
1977 ^b	Confidential								
1978	173	20	618,357	1,362,306	93,633	7,875	6	0.75	1,022,000
1979	237	28	595,850	1,311,275	137,951	5,543	4	0.75	943,000
1980	197	21	968,829	2,011,736	107,261	10,212	9	0.45	905,000
1981/82 ^c	466	50	2,614,545	5,566,463	295,138	11,945	9	0.70	3,897,000
1982/83 ^d	991	111	2,004,075	4,546,311	481,542	4,588	4	0.75	3,410,000
1983/84	1,079	103	2,044,505	4,752,148	503,464	4,408	4	1.05	4,989,000
1984/85 ^e	1,163	106	2,393,974	5,303,052	627,441	4,564	4	1.45	7,689,000
1985 ^e	1,243	125	1,791,446	4,160,435	599,291	3,347	3	1.20	4,992,522
1986	577	81	439,738	967,423	199,881	1,667	2	1.15	1,112,500
1987	379	45	747,117	1,450,983	150,067	3,828	5	1.26	1,828,000

-Continued-

Table 2-5. (page 2 of 2)

Year	Landings	Vessels	Number of Crab	Number of Pounds	Pots Lifted	Average Lbs Per Landing	CPUE	Average Price/Pound	Exvessel Value
1988	363	50	1,064,387	2,125,114	203,217	5,854	5	1.06	2,253,000
1989	359	47	1,428,973	3,077,937	185,242	8,574	8	1.10	3,385,730
1990	519	62	1,294,241	2,937,306	296,168	5,660	5	1.54	4,435,000
1991	732	62	695,470	1,414,499	279,872	1,932	1	1.37	1,938,000
1992	501	46	805,215	1,656,793	218,602	3,306	3	0.86	1,425,000
1993	263	42	647,736	1,369,889	180,534	5,209	5	0.92	1,260,000
1994	162	31	426,848	948,461	151,888	5,855	5	1.20	1,138,000
1995	106	24	257,677	527,434	107,506	4,976	4	1.72	907,000
1996	113	21	334,237	668,772	88,682	4,223	4	1.01	675,460
1997	123	21	257,692	529,601	95,067	4,296	3	2.05	1,085,682
1998	58	11	185,087	370,836	63,837	6,394	3	1.41	518,606
1999	70	18	269,244	550,568	64,552	7,865	4	1.57	861,919

^aSeason open year round 1962 - 1976

^bOpen May 1 through December 31, 1977 - 1980

^cOpen February 27, 1981 through February 1, 1982

^dOpen May 1, 1982 through February 1, 1983

^eOpen May 1, 1985 through December 31, 1985

Table 2-6. Keel length frequencies of vessels landing Dungeness crab during the 1999 Kodiak District fishing season.

Vessel Keel Length (feet)	Number of Vessels
<20-29	2
30-39	3
40-49	5
50-59	4
60-69	1
70-79	1
80-89	2
<u>≥ 90</u>	0
TOTAL VESSELS:	18

Table 2-7. Dungeness crab commercial harvest (in pounds) by fishing section, Kodiak Management District, 1990-1999.

Section	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Northeast	65,703	266,187	201,984	34,080	7,725	4,222	6,865	2,523	---- ^a	16,155
Eastside	170,081	141,053	270,370	115,421	75,740	101,333	132,617	97,221	104,177	319,336
Southeast	2,479,534	805,459	859,492	776,258	637,338	331,609	422,682	343,310	244,880	197,835
Southwest	101,376	50,183	89,342	95,128	34,038	52,804	62,938	52,035	8,609	---- ^a
N. Mainland	18,723	36,831	36,202	68,325	19,987	---- ^a	22,028	26,087	0	10,820 ^f
S. Mainland	0	---- ^a	0	^b	^d	0	0	3702	0	---- ^a
Westside	101,889	114,786	199,403	280,677	173,633	37,466 ^c	21,592	4,723	13,170 ^e	6,422
Total	2,937,306	1,414,499	1,656,793	1,369,889	948,461	527,434	668,722	529,601	370,836	550,568

^aLess than three vessels participated.

^bNorth Mainland and South Mainland catches combined because less than three vessels participated (1993).

^cNorth Mainland and Westside Section catches combined because less than three vessels participated (1995).

^dSouthwest and South Mainland catches combined because less than three vessels participated (1994).

^eWestside Section and Northeast Section catches combined because less than three vessels participated (1998).

^fSouthwest, North and South Mainland Section catches combined because less than three vessels participated (1999).

Table 2-8. Historic commercial red king crab catch and effort for the Kodiak Registration Area "K", 1960-1999.

Fishing Year ^a	Vessels	Landings	Number of Crab	Number of Pounds	Pots Lifted	Average		
						CPUE	Weight Per Crab	Price Per Pound
1960/61	143	NA ^b	2,116,375	21,064,871	NA	NA	NA	\$ 0.09
1961/62	148	NA	3,181,554	28,962,900	NA	NA	NA	0.10
1962/63	195	NA	4,146,143	37,626,703	NA	NA	NA	0.10
1963/64	181	NA	4,158,988	37,716,223	NA	NA	NA	0.10
1964/65	189	NA	4,923,309	41,596,518	95,951	51	NA	0.10
1965/66	175	NA	11,061,709	94,431,026	173,083	64	NA	0.13
1966/67 ^c	213	NA	8,476,299	73,817,779	223,174	38	NA	0.11
1967/68	227	3,847	5,147,321	43,448,492	207,392	25	NA	0.26
1968/69	178	1,839	2,348,950	18,211,485	119,146	20	NA	0.26
1969/70 ^d	136	978	1,606,181	12,200,571	96,841	17	NA	0.28
1970/71	100	830	1,561,318	11,719,970	119,192	13	NA	0.30
1971/72	89	507	1,539,157	10,884,152	66,166	23	NA	0.39
1972/73	88	683	2,029,670	15,479,916	70,806	29	NA	0.55
1973/74	129	837	1,847,679	14,397,287	77,826	24	NA	0.45
1974/75	158	1,195	2,910,201	23,582,720	110,297	26	NA	0.45
1975/76	169	1,569	2,976,909	24,061,651	113,795	26	8.1	0.66
1976/77	195	1,165	2,177,956	17,966,846	130,777	17	8.2	1.37
1977/78	179	1,186	1,590,477	13,503,666	145,867	11	8.5	1.34
1978/79	194	1,077	1,464,021	12,021,850	177,261	8	8.2	1.60
1979/80	247	1,346	1,979,394	14,608,900	207,991	9	7.3	0.95
1980/81	164	1,175	2,787,199	20,448,654	201,531	14	7.3	1.05
1981/82	246	2,214	3,035,674	24,237,601	388,751	8	8.0	2.00
1982/83	309	1,373	1,011,109	8,729,761	283,795	4	8.6	3.75

No commercial fishery has occurred since the 1982/83 season.

AVERAGE ^e	174	1,359	2,963,898	24,834,120	143,813	21		
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^aFishing year defined as May 1 - April 30.

^bNot available.

^cJuly 1 - April 30 season established.

^dAugust 15 - January 15 season established.

^eAverage includes only years with open fishing season.

Table 2-9. Kodiak red king crab harvest composition and seasons, 1960-1999.

Season	Open	Closed	Catch Million Pounds	Percent Recruits ^a	Percent Post -Recruits	Size Limit (Inches)
1960/61	1-Jul	30-Jun	18.9	8	92	6.5
1961/62	1-Jul	30-Jun	29	36	64	6.5
1962/63	1-Jul	30-Jun	37.6	26	74	6.5
1963/64	1-Jul	30-Jun	35	33	67	7.0
1964/65	1-Jul	30-Jun	41.6	48	52	7.0
1965/66	1-Jul	30-Apr	94.4	35	65	7.0
1966/67	1-Jul	30-Apr	73.8	28	72	7.0
1967/68	1-Jul	30-Apr	43.4	27	73	7.0
1968/69	15-Jun	31-Mar	18.2	61	39	7.0
1969/70	15-Aug	15-Jan	12.2	59	41	7.0
1970/71	15-Aug	15-Jan	11.7	38	62	7.0
1971/72	15-Aug	29-Oct	10.9	75	25	7.0
1972/73	15-Aug	13-Oct	15.5	47	53	7.0
1973/74	15-Aug	25-Oct	14.4	49	51	7.0
1974/75	15-Aug	21-Sep	20.9	52	48	7.0
1975/76	15-Oct	15-Jan	2.2	3	97	8.0
	15-Aug	20-Oct	21.6	48	52	7.0
	20-Oct	1-Dec	2.5	3	97	8.0
1976/77	1-Sep	16-Oct	14.6	33	67	7.0
1977/78	1-Dec	15-Jan	3.1	0.5	99.5	8.0
	15-Sep	30-Nov	11.7	37	63	7.0
	1-Dec	15-Jan	1.8	0.7	99.3	8.0
1978/79	10-Sep	30-Nov	10.3	44	56	7.0
1979/80	1-Dec	15-Jan	1.7	15	85	7.5
	10-Sep	30-Nov	13.4	70	30	7.0
	1-Dec	15-Jan	1.2	30	70	7.5
1980/81	15-Sep	30-Nov	18.4	69	31	7.0
1981/82	1-Dec	15-Jan	2.1	22	78	7.5
	15-Sep	15-Dec	20.3	61	39	7.0
	15-Dec	15-Jan	3.9	7	93	7.5
1982/83	1-Sep	10-Dec	7.5	46	54	7.0
	10-Dec	19-Dec	1.2	19	81	7.5

No commercial fishery has occurred since the 1982/83 season.

^aRecruitment after 1963 based on 7" size limit.

Table 2-10. Historic commercial golden king crab *Lithodes aequispinus* catch and effort for the Kodiak Registration Area "K", 1983-1999.

Fishing Year	Landings	Vessels	No. of Crabs	No. of Pounds	Pots Lifted	Average		Price Per Pound	Exvessel Value (Millions)
						CPUE	Weight of Crab		
1983	36	12	16,349	111,398	8,490	2.0	6.8	3.00	0.3
1984	8	6	3,513	22,066	1,950	2.0	6.3	2.50	0.1
1985	19	4	10,005	63,641	2,693	4.0	6.4	1.95	0.1
1986	31	4	21,862	146,478	5,463	4.0	6.7	3.00	0.4
1987	38	5	9,484	67,191	3,187	3.0	7.1	3.44	0.2
1988					Confidential				
1989					Confidential				
1990	6	3	1,214	7,314	1,090	1.0	6.0	3.00	0.2
1991	0	0	0	0	0	NA	NA	NA	NA
1992					Confidential				
1993					Confidential				
1994	0	0	0	0	0	NA	NA	NA	NA
1995					Confidential				
1996	0	0	0	0	0	NA	NA	NA	NA
1997	0	0	0	0	0	NA	NA	NA	NA
1998	0	0	0	0	0	NA	NA	NA	NA
1999	0	0	0	0	0	NA	NA	NA	NA

Table 2-11. Historic commercial trawl shrimp catch and effort for the Kodiak District of Westward Registration Area "J", 1958-1999.

Calendar Year	Fishing Year	Vessels	Landings	Harvest in Pounds	Price
1958		NA	NA	31,886	\$0.04
1959		NA	NA	2,861,900	\$0.04
1960		11	94	3,197,985	\$0.04
1961		12	203	11,083,500	\$0.04
1962		11	204	12,654,027	\$0.04
1963		NA	NA	10,118,472	\$0.04
1964		6	NA	4,339,114	\$0.04
1965		11	320	13,823,061	\$0.04
1966		17	551	24,097,141	\$0.05
1967		23	NA	38,267,856	\$0.05
1968		16	NA	34,468,713	\$0.04
1969		26	935	41,353,461	\$0.06
1970		18	1,024	62,181,204	\$0.04
1971		49	1,746	82,153,724	\$0.04
1972		63	1,398	58,352,319	\$0.04
1973		50	1,283	70,511,477	\$0.06
	1973/74	63	1,029	56,203,992	\$0.08
	1974/75	75	1,100	58,235,982	\$0.08
	1975/76	58	884	49,086,591	\$0.08
	1976/77	62	762	46,712,083	\$0.10
	1977/78	58	653	26,409,366	\$0.13
	1978/79	50	328	20,506,021	\$0.17
	1979/80	37	242	12,863,536	\$0.23
	1980/81	67	462	27,101,218	\$0.29
	1981/82	55	298	19,112,367	\$0.27
	1982/83	40	224	10,391,207	\$0.27
	1983/84	14	63	2,779,030	\$0.35
	1984/85	13	59	2,942,922	\$0.33
	1985/86	5	26	1,145,980	\$0.20
	1986/87		Confidential		
	1987/88		Confidential		
	1988/89	0	0	0	0
	1989/90	0	0	0	0

-Continued-

Table 2-11 . (page 2 of 2)

Calendar Year	Fishing Year	Vessels	Landings	Harvest in Pounds	Price
	1990/91	0	0	0	0
	1991/92	0	0	0	0
	1992/93	0	0	0	0
	1993/94	3	3	1,704	NA
	1994/95	0	0	0	0
	1995/96	0	0	0	0
	1996/97		Confidential		
	1997/98	4	7	11,905	\$0.22
	1998/99	3	6	6,035	NA
Averages ^b		33	556	25,917,820	\$0.12

Catch confidential when less than three vessels participated.

^aNot available.

^bAverage calculated from years 1960-1985.

Table 2-12. ADF&G shrimp population survey estimates, 1995 and 1998.

Area	MABI ^a	1995 Survey	1998 Survey
	(millions of pounds)		
Chiniak	1.45	0.17	0.12
Marmot	29.24	2.84	1.10
Kiliuda Bay	5.3	0.13	0.15
Twoheaded Gully	7.3	0.13	0.15
Alitak Bay	4.28	0.02	0.24
Uyak Bay	3.19	0.23	0.37
Uganik Bay	2.59	0.93	0.30
Wide Bay	1.05	0.08	NA
Chignik Bay	4.55	1.00	NA
Kuiukta Bay	1.9	0.36	NA

^aMinimum Acceptable Biomass Index (MABI). This is the threshold value needed to conduct a fishery.

Table 2-13. Commercial pot shrimp catch statistics, Kodiak District of Statistical Area 'J', 1969-1999.

Year	Vessels	Landings	Pounds
1969		Confidential	
1970	NA ^a	20	12,302
1971	0	0	0
1972		Confidential	
1973		Confidential	
1974	6	73	10,336
1975	7	77	12,782
1976		Confidential	
1977	3	26	2,565
1978		Confidential	
1979		Confidential	
1980	4	25	4,700
1981	4	6	2,511
1982	6	18	9,754
1983	12	31	18,686
1984	6	21	4,361
1985		Confidential	
1986		Confidential	
1987	0	0	0
1988		Confidential	
1989		Confidential	
1990		Confidential	
1991	0	0	0
1992	0	0	0
1993	0	0	0
1994		Confidential	
1995	0	0	0
1996	0	0	0
1997		Confidential	
1998		Confidential	
1999	2	0	

Catch information confidential when less than three vessels participated.

^aNot available.

Table 2-14. Commercial harvest statistics of red sea cucumbers in the Kodiak and Chignik Districts, 1991-1999.

Year	Number of Permits	Number of Landings	Pounds Harvested	Average Price Per Pound (Dollars)
1991		Confidential		
1992		Confidential		
1993	50	487	564,516	0.93
1994	86	269	413,576	1.20
1995	21	60	145,092	1.25
1996	31	93	162,451	1.25
1997	26	65	132,337	1.16
1998	16	55	142,313	1.20
1999	19	36	116,134	1.20

Table 2-15. Red sea cucumber commercial harvest by area, Kodiak and Chignik Districts, 1999.

Area	Guideline Harvest Level	Pounds Harvested
Chignik District Total	25,000	0
Kodiak District		
Northeast Section	5,000	4,435
Eastside Section	40,000	39,631
Southeast Section	25,000	25,676
Southwest Section	20,000	16,147
Westside Section	30,000	30,246
North Mainland Section	5,000	0
Totals	150,000	116,135

Table 2-16. Historic harvest of green sea urchins in the Kodiak area, 1980-1999.

Year	Number of Permits	Number of Landings	Pounds Harvested (Live Weight)	Average Price Per Pound
1980		Confidential		
1985-1986 ^a	NA	26	45,560	0.35
1987	12	78	104,139	0.69
1988	28	260	190,509	0.80
1989	29	81	44,862	0.82
1990	25	83	84,004	0.84
1991	6	24	29,947	0.92
1992-1994 ^a	22	95	73,399	1.15
1995	8	50	38,437	1.34
1996	7	31	36,147	1.10
1997-1999 ^a	10	15	20,595	1.01

^a Years combined because less than three processors participated.

Table 2-17. Commercial catch, effort, and value for octopus in the Kodiak Management Area including both state and federal waters, 1977-1984.

Year	Number Vessels	Number Landings	Catch (Pounds)	Average Price per Pound	Exvessel Value (Dollars)
1977	5	9	1,600	0.71	1,136
1978	11	21	3,336	0.75	2,502
1979	20	43	6,978	0.74	5,164
1980	27	61	19,342	0.75	14,507
1981	21	46	5,872	0.70	4,110
1982	12	29	3,854	0.70	2,698
1983	12	20	4,010	0.70	2,807
1984	17	43	6,487	0.70	4,541

Table 2-18. Commercial catch, effort, and value for octopus in the Kodiak Management Area from state and federal waters, 1985-1999.

Year	State water harvest			Federal water harvest			Total, state and federal waters				
	Vessels	Landings	Catch (Pounds)	Vessels	Landings	Catch (Pounds)	Vessels ^a	Landings	Catch (Pounds)	Ave. Price per Pound	Exvessel Value (Dollars)
1985	6	6	2,229	4	4	2,583	9	10	4,812	0.78	3,753
1986			Confidential				5	7	643	0.70	450
1987			Confidential				7	15	14,151	1.08	15,283
1988			Confidential				4	4	1,949	1.08	2,105
1989						Confidential					
1990	25	95	55,246	6	45	19,570	22	140	74,816	1.08	80,801
1991	57	264	107,030	17	90	27,936	59	354	134,966	1.07	144,414
1992	71	227	93,550	26	264	51,343	73	491	144,893	1.07	155,036
1993	21	80	92,784	28	69	10,843	41	149	103,627	1.00	103,627
1994	15	45	9,129	4	15	1,320	15	60	10,449	0.59	6,165
1995	48	361	86,933	16	77	6,031	45	438	92,964	0.58	53,919
1996	40	218	63,117	8	90	29,140	27	308	92,257	0.55	50,741
1997	66	538	198,014	35	153	40,940	65	691	238,954	0.55	131,425
1998	56	427	216,640	46	290	109,430	66	717	326,070	0.45	146,732
1999	51	336	172,869	39	178	53,427	77	514	226,296	0.40	90,518

^a Some vessels made landings from both state and federal waters.

Table 2-19. Razor clam commercial catch, effort and value in the Kodiak Management Area, 1960-1999.

Year	Number of Registered Diggers ^a	Number of Landings	Catch (Pounds)	Average Catch Per Landing (Pounds)	Average Price Per Pound	Est. Price Exvessel (Dollars)
1960	76	NA	420,636	NA	\$0.11	44,000
1961	95	NA	381,971	NA	\$0.11	40,000
1962	66	NA	297,516	NA	\$0.11	31,000
1963	39	NA	323,757	NA	\$0.11	35,600
1964	2	NA	0	NA	\$0.00	0
1965	4	NA	20,000	NA	\$0.25	5,000
1966	29	NA	15,429	NA	\$0.38	6,000
1967	9	NA	2,155	NA	\$0.40	900
1968	19	NA	6,384	NA	\$0.40	2,600
1969	5	6	12,029	2,005	\$0.40	4,812
1970	6	32	132,261	4,133	\$0.40	53,000
1971	73	82	190,394	2,322	\$0.30	57,000
1972	95	128	152,116	1,188	\$0.35	53,000
1973	64	140	165,282	1,181	\$0.40	66,000
1974	58	74	198,381	2,681	\$0.50	99,000
1975	18	5	6,188	1,238	\$0.50	3,000
1976	9	0	0	0	\$0.00	0
1977			Confidential			
1978			Confidential			
1979	0	0	0	0	\$0.00	0
1980	NA	8	8,006	1,001	\$0.79	6,325
1981	NA	5	8,186 ^b	1,637	\$1.00	8,186
1982	NA	11	11,608 ^c	1,055	\$1.00	11,608
1983	NA	7	7,920	1,131	\$1.00	7,920
1984	NA	21	33,972	1,613	\$1.00	33,972
1985	NA	11	16,945 ^d	1,540	\$1.00	16,945
1986	NA	4	3,993	998	\$1.00	3,993

No commercial harvest has occurred since 1986

^a Represents registered diggers not actual diggers. No data available after 1977 due to statewide issuance of Interim Use Permits.

^b Additional 1,985 pounds of hardshell clams harvested.

^c Additional 1,506 pounds of hardshell clams harvested.

^d Additional 1,496 pounds of hardshell clams harvested.

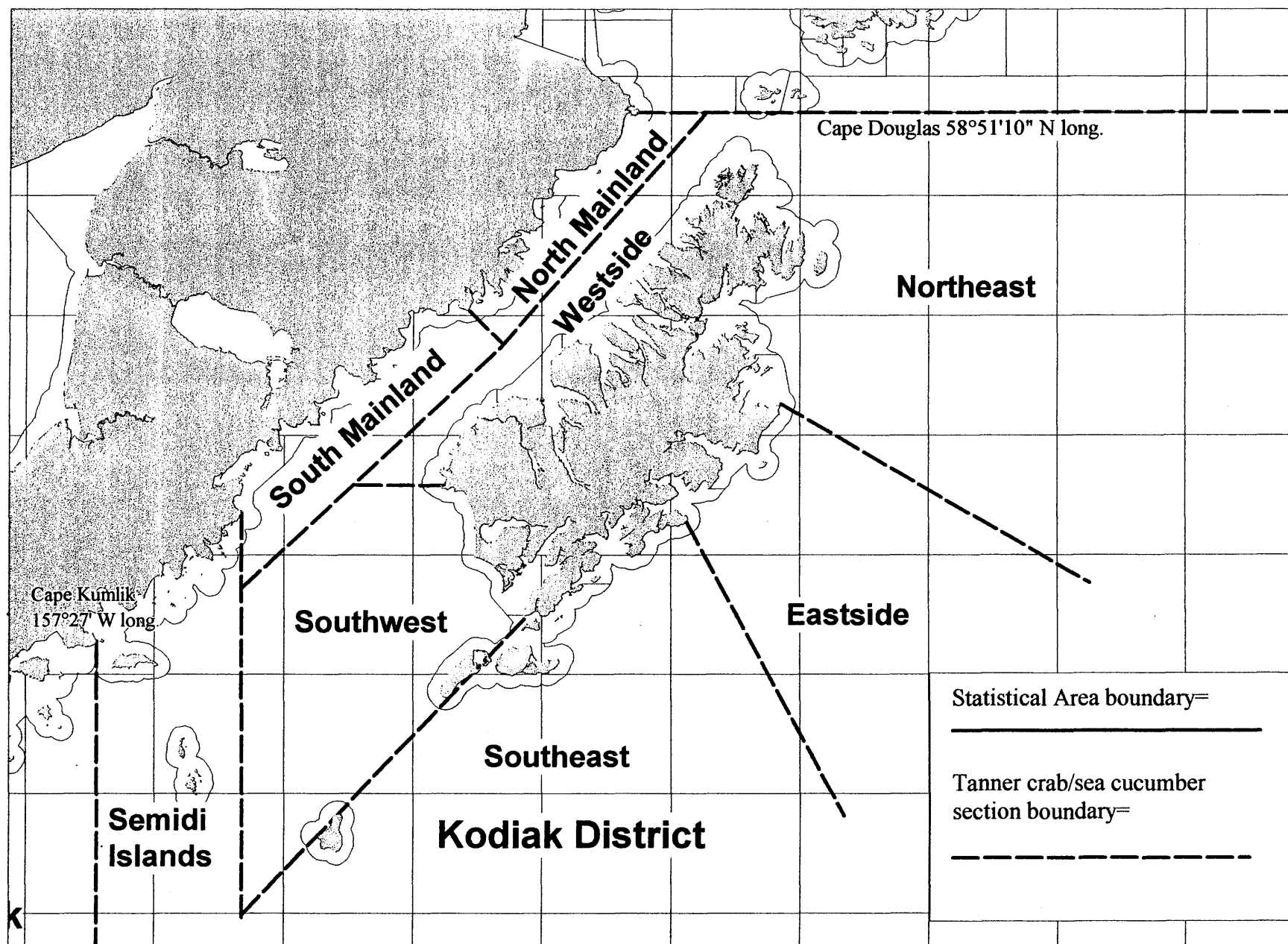


Figure 2-1. The Kodiak Area for shellfish management with statistical area grid and Tanner crab/sea cucumber sections shown.

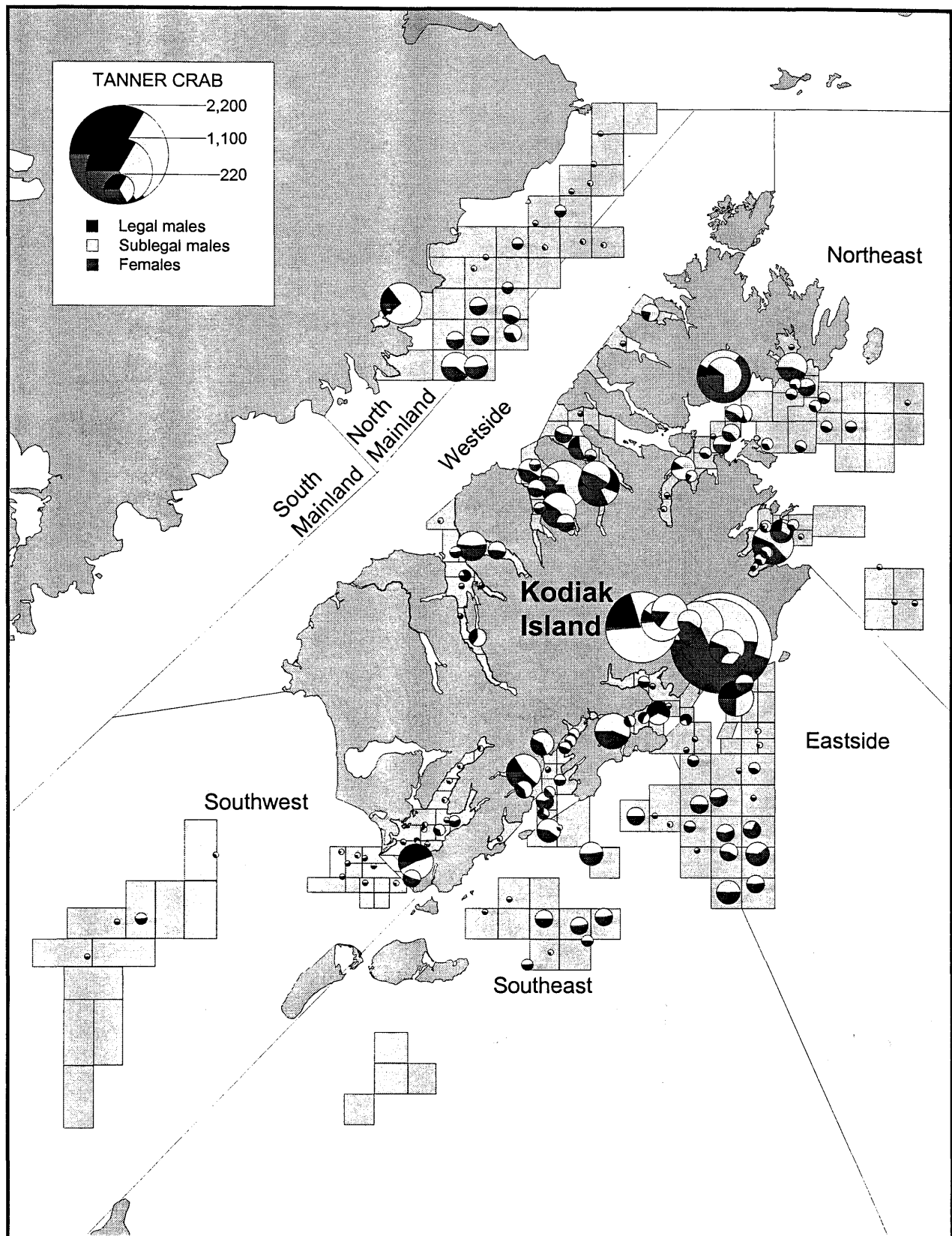


Figure 2-2. The number of Tanner crab per kilometer towed from the 1999 Kodiak trawl survey.

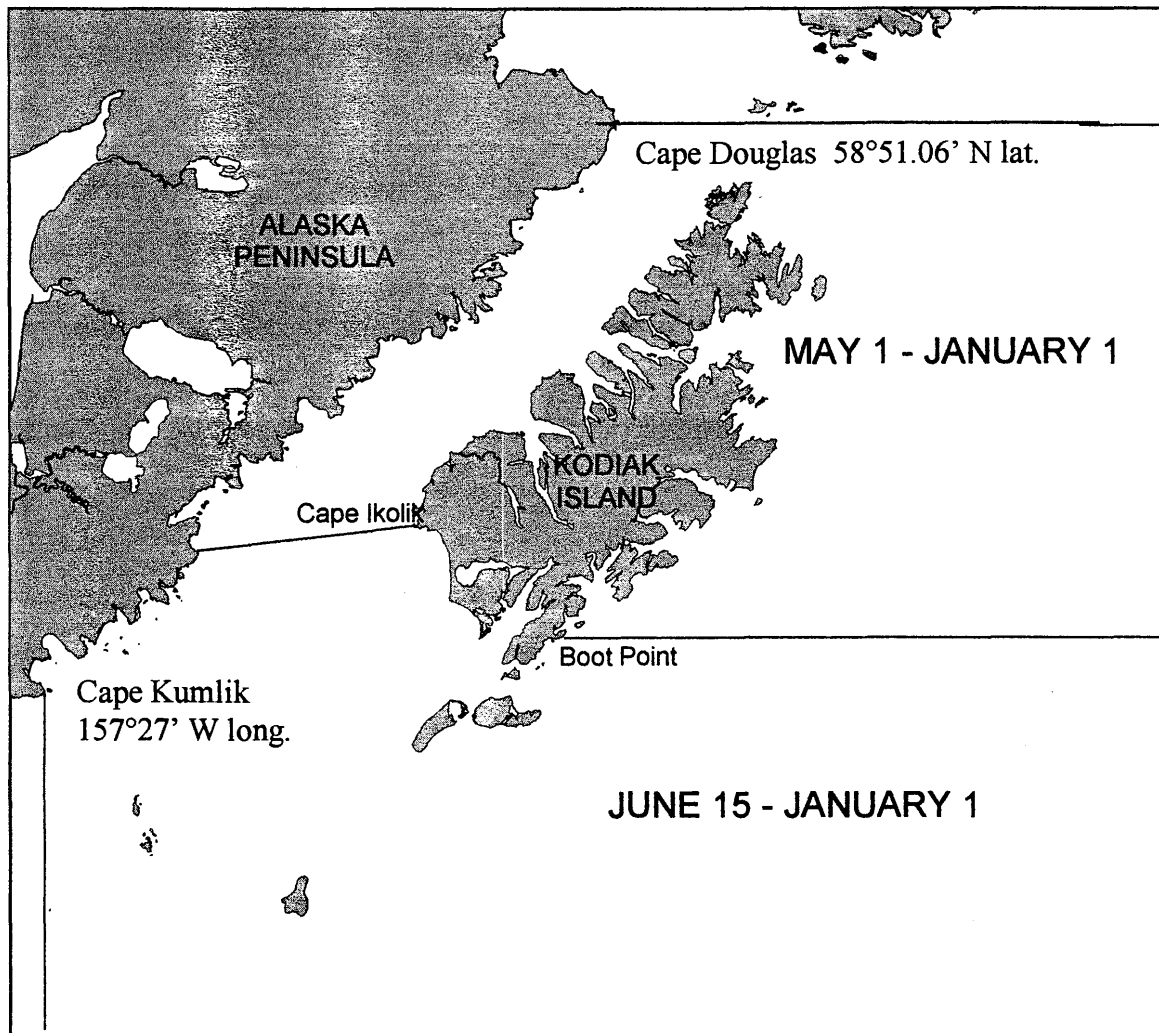


Figure 2-3. Kodiak District commercial Dungeness crab fishing season.

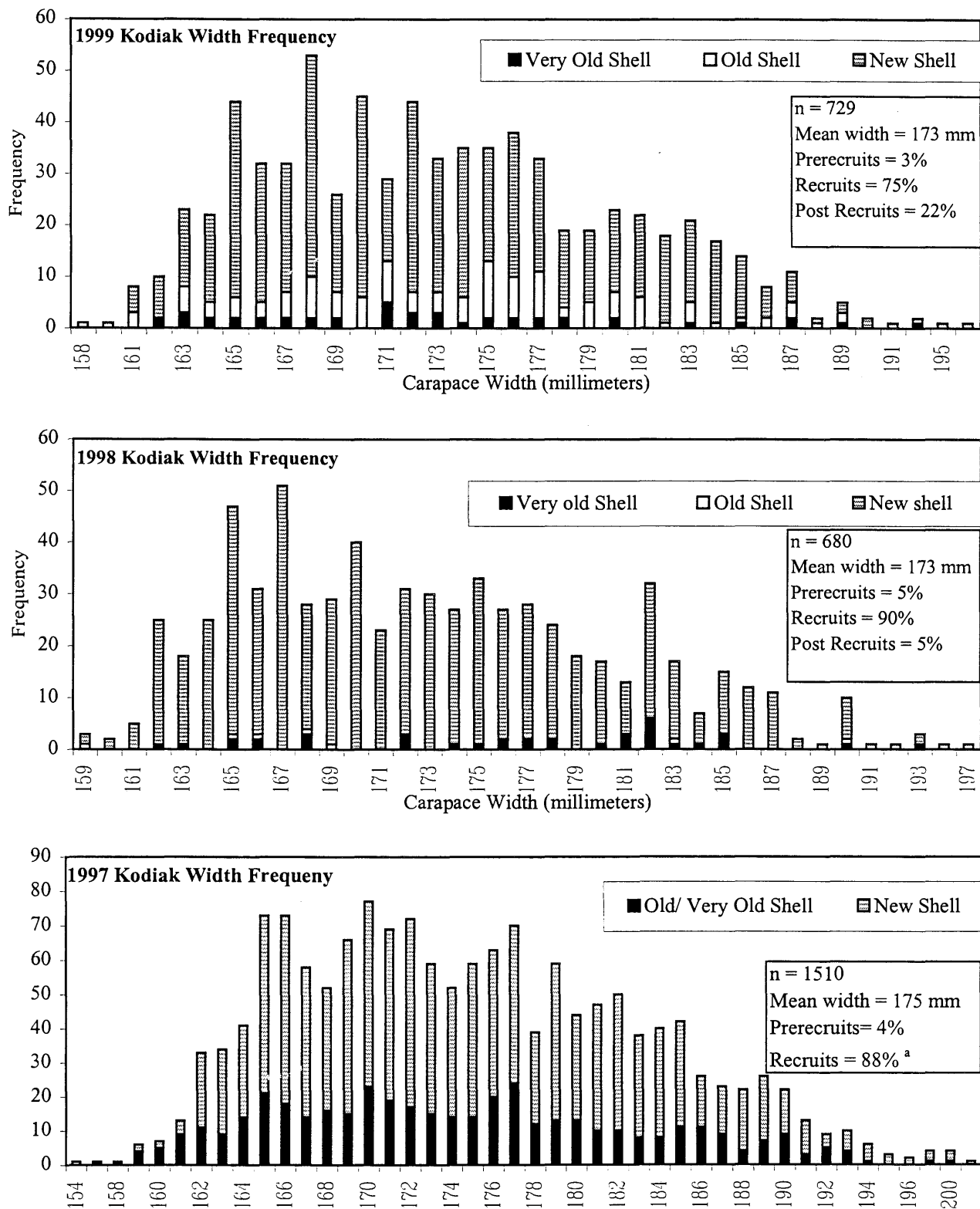


Figure 2-4. Kodiak District commercial Dungeness crab width frequencies and shell conditions, 1997-1999.

^a Remaining percentage composed of post recruit animals.

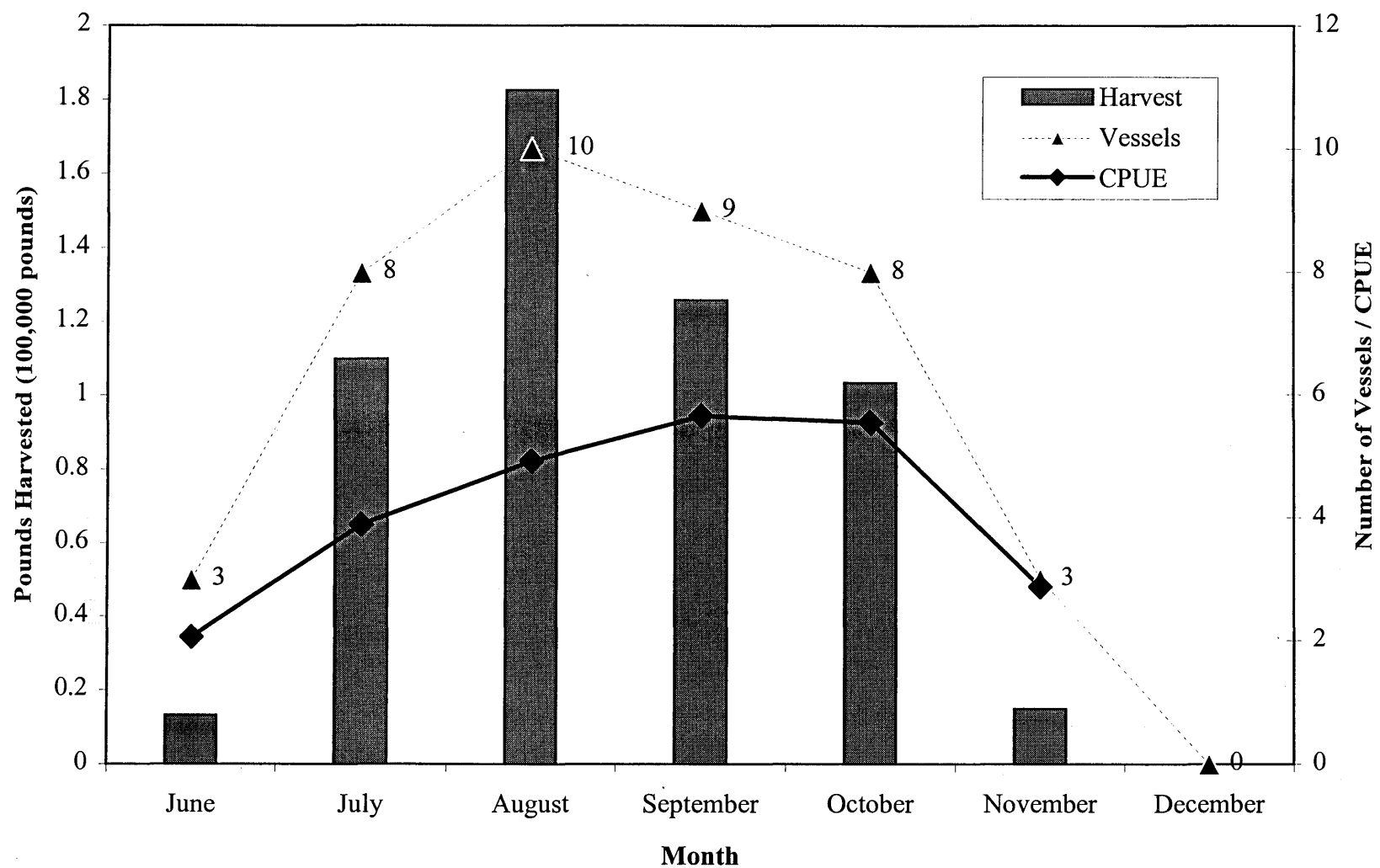


Figure 2-5. Kodiak District commercial Dungeness harvest and vessels participating by month, 1999.
Harvest from May not shown because less than three vessels participated.

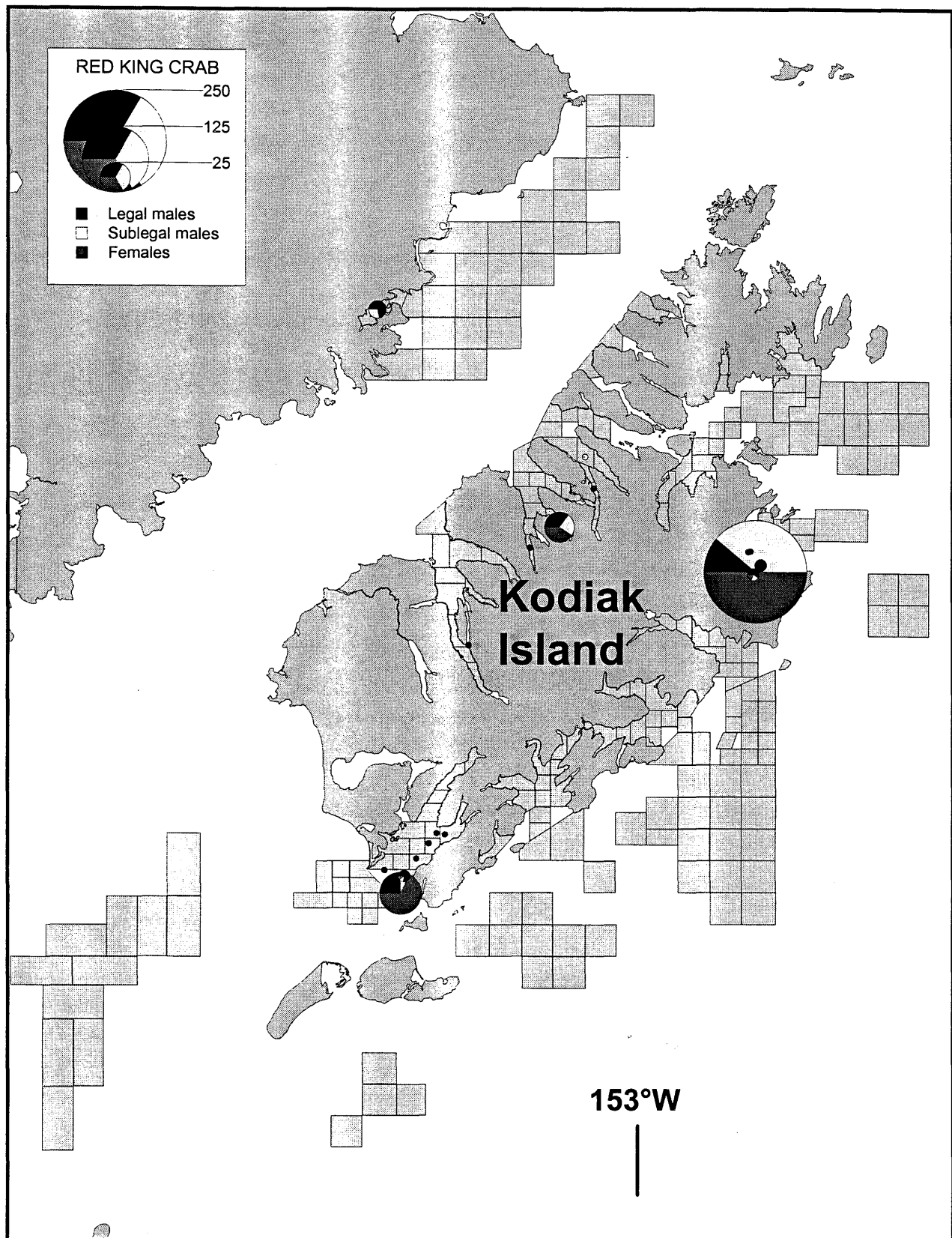


Figure 2-6. The number of red king crab per kilometer towed from the 1999 Kodiak trawl survey.

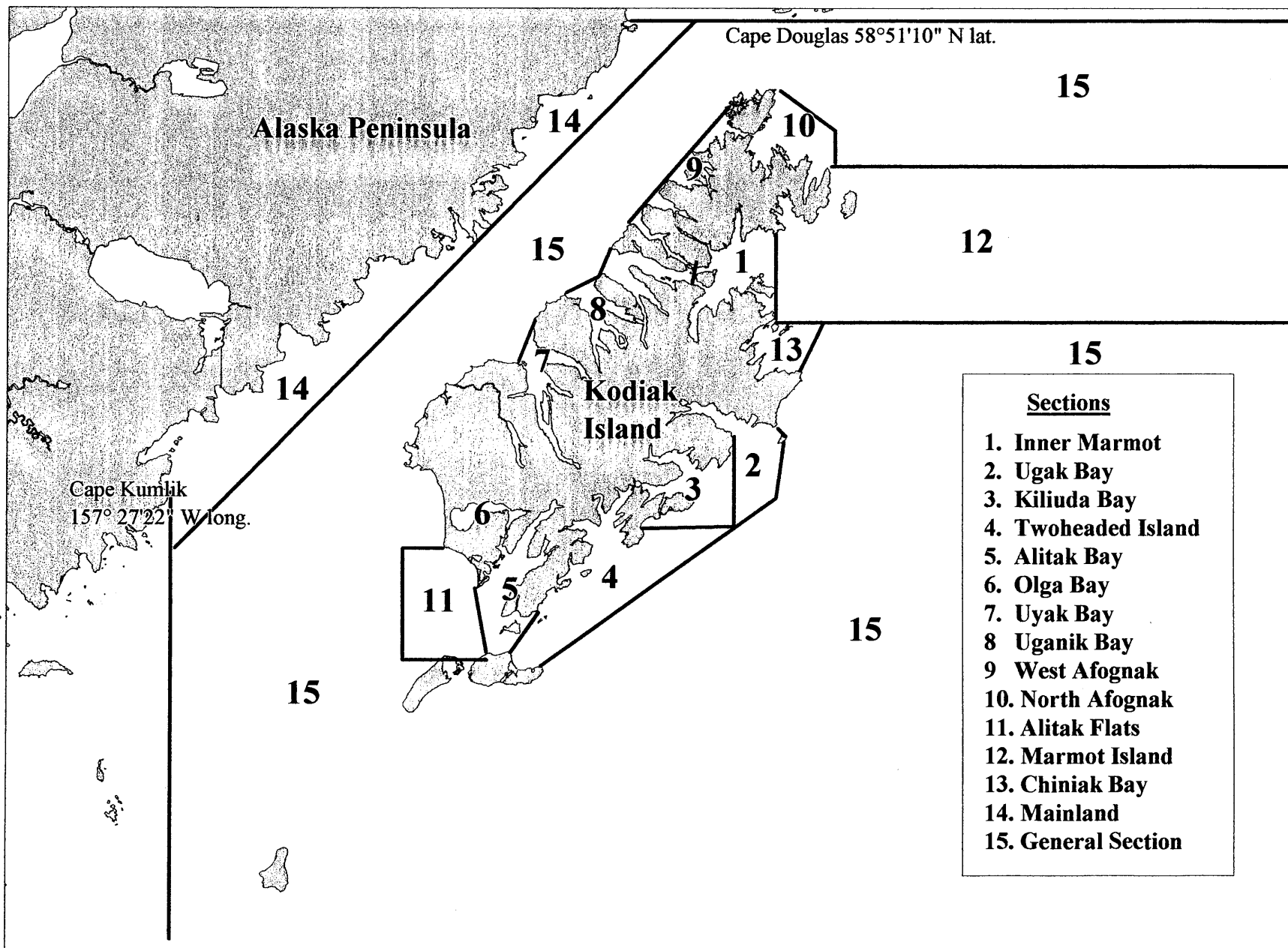


Figure 2-7. Kodiak District trawl shrimp fishing sections.

ANNUAL MANAGEMENT REPORT FOR THE
SHELLFISH FISHERIES OF THE ALASKA PENINSULA AREA, 1999

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ALASKA PENINSULA

Introduction

The Alaska Peninsula Management Area includes those waters of the Pacific Ocean west of the longitude of Cape Kumlik (157° 27' W long.) and east of the longitude of Scotch Cap Light (164°44' W long.) (Figure 3-1).

Commercial shellfish fisheries have occurred in the Alaska Peninsula Area for red king crab *Paralithodes camtschaticus*, Tanner crab *Chionoecetes bairdi*, grooved Tanner crab *Chionoecetes tanneri*, Dungeness crab *Cancer magister*, various pandalid shrimp, weathervane scallops *Patinopecten caurinus*, red sea cucumbers *Parastichopus californicus*, and giant Pacific octopus *Octopus dofleini*. Shellfish stocks are considered depressed for most species within the management area. No commercial fishery for king crab or shrimp has occurred since 1982. The last commercial fishery for Tanner crab occurred in 1989. Limited effort has occurred on Dungeness crab, weathervane scallops, red sea cucumbers, grooved Tanner crab, and octopus. The 1999 weathervane scallop fishery in the Alaska Peninsula is described with other Westward Region scallop areas in section six of this report. The Alaska Peninsula Area includes the communities of Chignik Lake, Chignik Lagoon, Chignik, Perryville, Ivanoff, Sand Point, King Cove, Cold Bay, and False Pass.

KING CRAB

Introduction

The Alaska Peninsula King Crab Registration Area 'M' includes the Pacific Ocean waters south of the Alaska Peninsula between the longitude of Cape Kumlik (157°27' W long.) and the longitude of Scotch Cap Light (164°44' W long.). Area M is further broken down into the Unimak Bight, Central, and West Chignik Districts (Figure 3-1). The Alaska Board of Fisheries (BOF) regulations set the South Alaska Peninsula Area as superexclusive registration area for king crab (ADF&G 1999).

Red King Crab

Historic Background

The red king crab fishery in Area M began in 1947, when 141,000 pounds were landed. The largest historic catch of 22.6 million pounds occurred in 1966 (Table 3-1).

Throughout the 1970s and early 1980s, most of the harvest occurred in the Central District with Pavlof Bay being the most productive area. The annual catch in the Unimak Bight District during the same period averaged less than half the annual harvest taken from the Central District. Catches in the West Chignik District during this period varied depending on effort, but annually did not exceed 386,000 pounds.

During the 1980/81 season, the Area M harvest reached just over five million pounds, the highest catch since the 1968/69 season. The catch was the result of strong recruitment from 1978 through 1980. Survival of young crabs has declined severely since that time, resulting in a closure of the fishery since the 1983/84 season.

Stock Status

The Alaska Department of Fish and Game has conducted a trawl survey of the Alaska Peninsula crab stocks annually since 1988 with the R/V Resolution. The 1999 survey consisted of 93 tows in king crab habitat throughout the registration area. Data from the survey indicate the red king crab population remains at very low levels. The total number of crabs captured in the 1999 survey decreased to 22 crabs (Figure 3-2) from the 61 crabs captured in 1998, resulting in the estimated population of crabs decreasing from 63,419 to 23,675 crabs. The decline occurred among all size classes of crabs (Worton 2000).

Golden King Crab

Historic Background

On occasion, fishermen express an interest in exploring Area M for golden or brown king crabs. In 1983, five vessels registered but no catch was landed. Presently, male golden king crab 6-inches or greater in shell width may be taken from January 1 through December 31 under a permit issued by the Commissioner (ADF&G 1999). No vessels registered to fish for golden king crab in Area M during 1999.

Stock Status

ADF&G does not assess golden king crab stocks in the Westward Region. Exploratory efforts by commercial fishermen have yet to locate quantities sufficient to sustain a fishery in the Alaska Peninsula Area.

TANNER CRAB

Introduction

The Alaska Peninsula Area contains all waters south of the Alaska Peninsula west of the longitude of Kilokak Rocks (156°20.22' W long.) and east of the longitude of Scotch Cap Light (164°44' W long.) The Alaska Peninsula Area is further broken down into the Chignik and South Peninsula Districts (Figure 3-3). The Alaska Board of Fisheries (BOF) regulations set the South Alaska Peninsula Area as nonexclusive registration area for Tanner crab (ADF&G 1999).

Chignik District Tanner Crab

Introduction

The Chignik District of Area J for Tanner crab contains all waters south of the Alaska Peninsula west of the longitude of Cape Kumlik (157° 27' W long.) and east of a line from Kupreanof Point (55°33.98' N lat., 159° 35.88' W long) to the easternmost point of Castle Rock (55° 16.51' N lat., 159° 29'59 W long.) and east of a line extending 135° southeast from the easternmost point of Castle Rock (Figure 3-3).

Historic Background

The Chignik Tanner crab *Chionoecetes bairdi* fishery began in 1968 when 21,000 pounds were harvested (Table 3-2). During the next four years, the market was uncertain and consequently harvests were erratic. Other than a 14-day closure before each king crab season and limiting gear to pots or ring nets, few regulations governed the early years fishery.

In 1973, market conditions improved and fishermen harvested nearly 750,000 pounds with 15 vessels. There were 25 vessels the next year, and the catch grew to 4 million pounds. Thirty-five vessels participated in the 1975/76 season with landings reaching a peak harvest of 7 million pounds. By 1976, the rapid growth of the fishery resulted in the Alaska Board of Fisheries (BOF) adopting new regulations. A system to register and inspect vessels before fisheries was adopted. The tank inspections were introduced to discourage fishing prior to the season opening. The harvest was restricted to male crabs with carapace width 5.5 inches or greater. The size limit was designed to allow mature male crabs the opportunity to reproduce at least once before being available to the commercial fishery. In addition, the season was restricted to the November 1 - May 15 period in order to protect crabs during the mating and molting period. The first guideline harvest levels (GHLs) were also established. Concern over ghost fishing of lost pots led to the adoption of a state statute requiring biodegradable escape mechanisms in pots.

Three other points characterized the first 14 years of the Chignik District fishery. First, the productive grounds included nearly all waters of the district with highest catches offshore between Mitrofanina Island, Lighthouse Rocks, and the Semidi Islands. Second, most of the effort occurred in late March after the Kodiak and South Peninsula District fisheries closed. Third, no abundance surveys were conducted during this period. The 5-10 million-pound guideline was based on the historical harvests from 1974 to 1976/77. Even with the relatively liberal seasons, this guideline was rarely attained.

Several changes occurred in the fishery after 1981. The department conducted trawl surveys each summer from 1981 to 1984, which predicted poor recruitment following the 1983 fishing season. Therefore, harvest projections were drastically reduced for the 1984 and 1985 fisheries.

As predicted, commercial fishing success and harvest dropped sharply each season from 1984 to 1986. Following a minor increase in 1987, the 1988 catch declined to 183,000 pounds, the lowest harvest in 16 years. The catch did not decline uniformly over the entire district, but fell off first and most rapidly in the popular offshore waters. Production from offshore waters decreased steadily until the harvest was limited to Chignik Bay and a few other near shore areas in 1988. Concurrent with dwindling catches, fleet size decreased from 48 vessels in 1983 to 6 vessels in 1988.

Beginning with the 1981 season, the fleet commenced fishing on November 1 and continued fishing until the district closed. However, several changes were subsequently made to the opening date of the fishery: in 1981/82 the opening date was moved to December 15, and then was set to February 10 for the 1983 and 1984 seasons. In part, the new dates were established to harvest the crab at peak quality. Further, some fishermen hoped the new dates would find the large vessels busy fishing in the Bering Sea, thus reducing competition in the Chignik and South Peninsula Districts. However, in the adjoining South Peninsula District, seasons opening in February were found to extend into the spring crab molting period. Therefore, beginning in 1985, the opening date was moved to January 15, and has remained as the opening date since. In 1988, the BOF adopted a March 31 closure date because crabs were molting and of unacceptable quality prior to the former May 15 closure. Since 1990, the Chignik District fishery has remained closed due to the continued low abundance of Tanner crabs in the area.

The BOF adopted pot limits in 1993 for the Chignik District. This pot limit, effective for the combined Chignik and South Peninsula Districts, was set at 40 pots when the guideline harvest level is less than 600,000 pounds and 75 pots when the guideline harvest is 600,000 pounds or greater.

At the March 1999 meeting, the department presented the BOF with a comprehensive Tanner crab harvest strategy inclusive of the Chignik District. The harvest strategy established thresholds of abundance that must be met, based on preseason survey population estimates, to allow for a commercial Tanner crab fishery (Urban et al. 1999). The harvest strategy requires additional criteria to be in place for an opening of commercial Tanner crab in the Chignik or South Peninsula Districts. Other management measures, largely the product of public input at the BOF meeting, resulted in a revised pot limit for the Chignik District of 30 pots regardless of the GHL. In addition, the South Peninsula District must be open for a fishery to occur in the Chignik District. The harvest strategy, as adopted by the BOF, can be found under 5 AAC 35.507 KODIAK, CHIGNIK, SOUTH PENINSULA DISTRICTS, *C. bairdi* TANNER CRAB HARVEST STRATEGIES in the statewide shellfish regulations (ADF&G 1999).

Stock Status

The department has conducted annual trawl surveys in the Chignik District since 1989. Population estimates of legal-sized crabs declined from 497,000 in 1989, to a record low of 59,800 in 1992. The 1999 survey estimated the total Tanner crab population at 3.7 million, a slight increase from the estimated 3.6 million crabs in 1998 (Worton 2000). Chignik Bay shows the highest densities of Tanner crab (Figure 3-4). The commercial fishery remained closed during 1999 because the threshold of abundance required for a commercial fishery was not met.

South Peninsula District Tanner Crab

Introduction

The South Peninsula District of Area J for Tanner crab (Figure 3-3) includes all waters south of the Alaska Peninsula and west of the line from Kupreanof Point (55°33.98' N lat., 159° 35.88' W long.) to the easternmost point of Castle Rock (55° 16.51' N lat., 159° 29'59 W long.) then extending 135° southeast from the easternmost point of Castle Rock and east of the longitude of Scotch Cap Light (164°44' W long.)

Historic Background

The first harvest of Tanner crab from the area occurred in 1967 when 3,100 pounds were landed. The fishery grew quickly and, by 1973, the harvest exceeded five million pounds (Table 3-3). Guideline harvest levels (GHLs) were established in 1974 and, in 1975, seasons were imposed to protect adult crab during the mating and molting period. In 1976, the minimum size limit of 5.5" CW was established. During the six fishing seasons from 1974 through 1978/79, harvests ranged from 5 to 9 million pounds. The fishery peaked in 1978/79 when 9 million pounds of crab were caught. From 1979 to 1984, the harvest and CPUE declined as a result of low recruitment and in the 1984 season the fleet only landed two million pounds. Recruitment improved in the years 1985 through 1988 and the harvest ranged from two million to 4 million pounds. The harvest decreased to 1 million pounds in 1989 and indications from the trawl survey predicted a decline in recruitment for future years. The fishery has been closed since 1990 due to the low abundance of legal-sized crab and the lack of recruitment. The BOF established a limit of 75 pots in 1993 for guideline harvest levels greater than 600,000 pounds. When the guideline harvest level is less than 600,000 pounds, the limit is 40 pots per vessel.

In 1999, the department presented the BOF with a comprehensive harvest strategy for Tanner crab in the South Peninsula District. The harvest strategy established thresholds of abundance that must be met, based on preseason survey estimates, to allow for a commercial Tanner crab fishery (Urban et al. 1999). The harvest strategy requires additional criteria to be in place for an opening of commercial Tanner crab fishery in the South Peninsula District. Management measures, largely the product of public input at the BOF meeting, resulted in a revised stair-step pot limit for the South Peninsula Area of 30, 40, or 75 pots per vessel depending on GHL size. The harvest strategy, as adopted by the BOF, can be found under 5 AAC 35.507 KODIAK, CHIGNIK, SOUTH PENINSULA DISTRICTS, *C bairdi* TANNER CRAB HARVEST STRATEGIES in the statewide shellfish regulations (ADF&G 1999).

Stock Status

The department conducted an annual trawl survey in the South Peninsula District in 1999 to assess Tanner crab populations. The total estimated abundance of legal-sized Tanner crabs in the South Peninsula from the 1999 survey was 316,677 crabs, an increase from the 1998 estimate of 258,423 crabs and the highest estimate since 1992 (Worton 2000). Morzhovoi Bay showed the highest densities of legal Tanner crab in the South Peninsula District (Figure 3-4). The South Peninsula District was above the established threshold level of 1,375,000 molting mature male crabs in 1999. Using the criteria within the harvest strategy for an estimated population less than or equal to the long-term average mature male abundance and using the historic fishery average weight of 2.25 pounds, the projected GHL would have been 213,758 pounds. The harvest strategy requires that twice the minimum GHL be in place for reopening the commercial fishery after a period of closure; in this case, a GHL of 400,000 pounds would be required. As the required GHL was not met, the commercial fishery remained closed in 1999.

Deep Water Tanner Crab

Historic Background

The Alaska Peninsula was initially explored for grooved Tanner crabs *Chionoecetes tanneri* and, to some extent, triangle Tanner crabs *C. angulatus* in 1994. Both species are found along the continental shelf break at great depths, with commercial fishing often occurring between 325 and 475 fathoms. The commercial fishery was permitted under the terms of 5 AAC 35.511 PERMITS FOR *Tanneri* AND *Angulatus* TANNER CRAB (ADF&G 1999). Vessels were required to use single line pot gear and carry ADF&G approved observers. A minimum legal size CW of 5.0 inches for *C. tanneri* and 4.5 inches for *C. angulatus* was stipulated. Two vessels fished in the Alaska Peninsula District during 1994 and their harvest remains confidential because of the low number of participants.

Interest in the deep water Tanner crab fishery increased in 1995. Six vessels made landings totaling 947,014 pounds (Table 3-4). Grooved Tanner crabs comprised the vast majority of deep water Tanner catch retained. The average catch per pot was 81 crabs with an average weight of 1.6 pounds. Average size of retained crabs was 133 mm in carapace width.

Performance of the fishery declined in 1996. Seven vessels made 35 deliveries but the catch fell to 553,028 pounds and CPUE declined to 17 crabs per pot. The price also fell from an average of \$1.60 to \$1.00 per pound. Much of the production came from previously unexplored areas.

New regulations passed by the BOF became effective in 1996. These regulations contained provisions allowing for the longlining of pots and established pot limits. Alaska Peninsula fishermen were allowed up to 300 small pots defined as those no more than 20 feet in perimeter and no more than 42 inches high or 150 large pots.

The department established conservative guideline harvest levels (GHLs) in February 1997. The South Peninsula District GHL was established at 200,000 pounds. Areas that had not been extensively fished had GHLs of 100,000 pounds to accommodate exploratory fishing. Additional requirements for testing escape mechanisms to lessen the amount of crab handled and discarded at sea were added to the conditions of the deep water Tanner permit. Given the reductions in GHLs, introduction of pot limits, declining CPUE, and the fall in market price for crab that followed economic difficulties in Asia, no vessels registered for the harvest of deep water Tanner crab during 1997 or 1998. Although a few vessel operators inquired about obtaining permits in 1999, none ever registered for the fishery.

Stock Status

Information on the biology of deep water Tanner crabs is limited. Data still need to be collected on size at maturity, handling morality, molt timing, and other important biological parameters. The department does not conduct population assessments but, as a condition of the operating permits, deep water Tanner vessels are required to carry onboard observers who are working to collect this information at the direction of ADF&G.

ALASKA PENINSULA DUNGENESS CRAB

Introduction

The Alaska Peninsula District for Dungeness crab (Figure 3-5) includes all waters of Statistical Area J west of the longitude of Cape Kumlik ($157^{\circ} 27'$ W long.) and east of the longitude of Scotch Cap Light ($164^{\circ} 44'$ W long.).

Historic Background

Historically, Dungeness crab catches from the district have been sporadic, with the highest catch recorded in 1968 when 1.26 million pounds were landed (Table 3-5). Subsequent effort and catches remained low for many years due to low prices and better prospects in other fisheries. During the early 1980s, the decline in king crab stocks and a stronger market for Dungeness crabs generated renewed interest in the fishery. As a result, local fishermen became concerned with over exploitation of the stock along with an increase in effort. In response, the BOF specified the Alaska Peninsula District as a superexclusive registration area in 1983. The superexclusive designation has reduced effort in the district and recent poor catches have also discouraged participation in the fishery.

Management of the Alaska Peninsula District Dungeness fishery has been achieved by '3-S management' wherein the sex, size and season are regulated. Only males greater than 6.5 inches in carapace width may be harvested from May 1 through December 31.

1999 Fishery

The 1999 Alaska Peninsula Dungeness crab season opened May 1. One vessel participated in 1999; therefore, all harvest information is confidential. Three vessels participated in 1998, making seven deliveries for a total harvest of 96,073 pounds (Table 3-5).

Stock Status

No stock assessments have been conducted on the Dungeness crab in the Alaska Peninsula Area. Department activity has been limited to monitoring commercial fishery deliveries, conducting vessel operator interviews, and recording the harvest. Five deliveries of Dungeness crab were sampled in 1998 and 1999. The harvest comprised 39% recruits and 58% post-recruits (Figure 3-6). Average carapace width was 175 millimeters. Given the few deliveries available for sampling and the scant anecdotal information from vessel operator interviews, no definitive conclusions can be readily drawn concerning the status of the Alaska Peninsula Dungeness crab stock.

ALASKA PENINSULA SHRIMP

Introduction

The Alaska Peninsula shrimp fishery is divided into the Chignik and South Peninsula Districts (Figure 3-7). The Chignik District contains all waters south of the Alaska Peninsula between the longitude of Kilokak Rocks (156° 20.22' W long.) and a line from Kupreanof Point (55°33.98' N lat., 159° 35.88' W long.) to the easternmost point of Castle Rock (55° 16.51' N lat., 159° 29'59 W long.) and east of a line extending 135° southeast from the easternmost point of Castle Rock. The South Peninsula District comprises all waters south of the Alaska Peninsula and west of a line from Kupreanof Point to Castle Rock that extends 135° southeast from the easternmost point of Castle Rock and east of the longitude of Cape Sarichef (164°55' W long.) Both districts are subdivided into sections that are managed according to the *Westward Region Shrimp Survey Management Plan*.

Historic Background

Shrimp fishing in the Alaska Peninsula and Chignik Districts began in 1968 but catch levels remained relatively low until the 1972/73 season when 19.5 million pounds were harvested (Table 3-6). The historic high catch was reached in the 1977/78 season harvest of 71.5 million pounds from the two districts. Catches declined rapidly until all South Peninsula Sections were closed in 1980. Although the Sutwik Island Section and all offshore waters of the Chignik District remained open in 1981/82, only 70,948 pounds of shrimp were landed from those areas. Since that time, all the inshore waters have remained closed and no fishing has occurred in the open area offshore. No vessels registered for the offshore sections that were open to fishing during the 1998/99 season.

Stock Status

ADF&G conducted a trawl survey in the Chignik Bay and Kuiukta Bay Sections of the Chignik District in 1995. A total of 13 shrimp tows were made and the catch of shrimp in the Chignik District averaged 146 pounds per nautical mile towed, down from the 246 pounds per nautical mile captured during the 1992 survey. The 1995 Chignik District population estimate was 1.4 million pounds, well below the 4.55 million pounds minimum acceptable biomass index (MABI) needed to open the commercial fishery. Due to time and budgetary constraints, the entire Chignik and South Alaska Peninsula Districts areas were not surveyed as part of the 1998 triennial shrimp survey. Based on the current trend of increasing fish populations and stable low level or decreasing populations of shrimp in surveyed areas around Kodiak and in Pavlof Bay, it is a reasonable assumption that no significant recruitment has occurred in the Chignik District since the 1995 survey. The next shrimp survey is scheduled for 2001.

The National Marine Fisheries Service (NMFS) has conducted a shrimp survey in Pavlof Bay for the past 25 years. The catch of shrimp in the Pavlof section during the 1999 survey was the lowest in the history of the survey. Pink shrimp occurred at a frequency of 1.7 kilograms per kilometer towed during the 1999 survey (Paul Anderson, NMFS, Kodiak, personal communication). Shrimp populations in the Pavlof Bay section are severely depressed; no significant recovery is anticipated in the near-term.

ALASKA PENINSULA SEA CUCUMBERS

Historic Background

The Alaska Peninsula was initially explored for the red sea cucumber in 1993. Diving effort occurred in the Chignik area, with the farthest west exploration occurring in Kuiukta Bay.

Thirteen divers landed 93,701 pounds of eviscerated product during the 1993 season, which occurred primarily in November and December. The following February, concerns about overharvest led the department to establish guideline harvest levels for the Westward Region using areas delineated by the Tanner crab sections and districts (Figure 3-3). A 50,000 pound eviscerated weight guideline was established for the Chignik District while the South Peninsula District remained open to exploratory fishing without an established GHL. A closed season was also established for the period of April 30 to October 1 to protect spawning aggregates of sea cucumbers. A weekly, five-day fishing period with daily dive logbook requirements was established to monitor the fishery.

Activity was sporadic throughout the winter but interest increased in March. The Chignik fishery remained open until April 8, 1994 when it was closed by emergency order after the guideline harvest was achieved. The Alaska Peninsula reopened for the 1994/1995 season on October 1, 1994. The weekly fishing period was reduced to a three day period. Poor fishery performance led to a reduction of the Chignik harvest guideline to 25,000 pounds. Effort was minimal for the remainder of the season with only 3 divers registered. The catch during this season remains confidential.

There was no effort during the 1995/1996 season in the Alaska Peninsula area. In 1996/1997, one vessel fished, and thus the harvest statistics remain confidential. During the 1997/1998 season four divers landed 13,427 pounds.

1999/2000 Fishery

No fishing occurred in the Chignik or South Peninsula Districts during the 1999/2000 sea cucumber fishery.

Stock Status

No biomass assessment is done on red sea cucumbers in the Westward Region. Since the establishment of conservative GHLs in 1995, little commercial harvest has occurred within the Alaska Peninsula Area. Actual population levels, especially at depths below those available to the divers, are unknown. In addition, the extent of the westward range of red sea cucumbers is not well documented, however ADF&G trawl surveys have captured *P. californicus* as far west as Pavlof Bay.

OCTOPUS

Historic Background

Giant Pacific octopus *Octopus dofleini* have been frequently harvested in the Alaska Peninsula area both as bait and as a food product since the early 1980s (Table 3-7). Some fishing has targeted octopus but the majority of the harvest has occurred incidental to pot gear fisheries. Until 1988, octopus was usually taken as bycatch during the Tanner crab fishery. Since then, octopus has been landed primarily by trawl and pot fishermen targeting Pacific cod. In recent years, over 90% of the octopus catch have been taken with pot gear. The majority of octopus harvest in the Alaska Peninsula Area has come from within state waters. In 1997, a harvest of 49,446 pounds was recorded on fish tickets as taken from state and federal waters. Of this amount, 48,286 pounds were harvested within state jurisdiction inside three nautical miles. This increase in reported landings of octopus in 1997 was in part due to improved tracking of octopus registrations and subsequent reporting of octopus as bycatch that began in the late 1990s. Additionally, more of the Pacific cod harvest in the Central and Western Gulf was taken with pot gear in that year, particularly with the advent of the state managed Pacific cod fishery.

The 1999 harvest of octopus in the Alaska Peninsula area totaled 1,604 pounds from state and federal waters. It is probable that the intense, short seasons for Pacific cod in both the federal and state fishery resulted in the unusually low harvest of octopus.

Stock Status

No stock assessment is currently conducted on this species in the Westward Region; the population status is unknown but assumed stable.

LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game) 1999. Commercial Shellfish Regulations, 1999-2000 edition. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.
- Urban, D., D. Pengilly, D. Jackson, I. Vining. 1999. A Tanner crab harvest strategy for Kodiak, Chignik, and the South Peninsula Districts. A Report to the Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Westward Region, Regional Information Report 4K99-21, Kodiak.
- Worton, C. *In press*. Bottom trawl survey of crab and groundfish: Kodiak Island, Chignik, South Peninsula and Eastern Aleutian Areas. Alaska Department of Fish and Game, Division of Commercial Fisheries Management, Regional Information Report, Kodiak.

Table 3-1. Catch and effort statistics for red king crab in the Alaska Peninsula Area M,
1947-1999.

Year	Vessels	Number Landings	Number Crab	Number Pounds	Pots Lifted	CPUE	Average Weight	Price Per Pound (\$)
1947	NA	NA	18,800	141,000	NA	NA	7.5	NA
1948	NA	NA	518,500	3,363,000	NA	NA	6.5	NA
1949	NA	NA	205,500	3,476,000	NA	NA	12.0	NA
1950	NA	NA	270,000	2,124,000	NA	NA	7.9	NA
1951	NA	NA	86,500	599,000	NA	NA	6.9	NA
1952	NA	NA	32,400	298,000	NA	NA	7.6	NA
1953	NA	NA	38,400	380,000	NA	NA	10.0	NA
1954	NA	NA	31,666	316,660	NA	NA	10.0	NA
1955	NA	NA	164,069	1,640,688	NA	NA	10.0	NA
1956	NA	NA	421,651	4,221,496	NA	NA	10.0	NA
1957	NA	NA	668,709	6,687,092	NA	NA	10.0	NA
1958	NA	NA	724,595	7,245,947	NA	NA	10.0	NA
1959	NA	NA	568,303	6,166,974	NA	NA	10.0	NA
1960	NA	1,496	677,100	6,700,000	NA	NA	9.9	NA
1961	NA	959	419,354	3,900,000	NA	NA	9.3	NA
1962	NA	657	287,624	2,273,013	NA	NA	7.9	NA
1963	27	1,037	970,739	6,539,129	NA	NA	6.7	0.09
1964	40	1,297	1,906,018	14,354,060	NA	NA	7.5	0.10
1965	36	1,081	1,813,728	14,713,501	NA	NA	8.1	0.10
1966	37	1,255	2,494,949	22,577,587	NA	NA	9.0	0.10
1967	39	1,062	1,943,463	17,252,307	NA	NA	8.9	0.19
1968/69	34	885	1,273,567	10,944,472	NA	NA	8.6	0.34
1969/70	33	415	558,800	4,137,000	51,300	11	7.7	0.25
1970/71	25	339	446,042	3,425,760	38,995	11	7.7	0.25
1971/72	26	364	597,394	4,123,130	41,759	14	6.9	0.28
1972/73	29	301	610,300	4,069,362	34,408	18	6.7	NA
1973/74	36	389	658,632	4,260,674	53,642	12	6.9	0.72
1974/75	36	318	644,054	4,572,101	44,951	14	7.1	0.43
1975/76	37	248	367,221	2,605,310	35,104	11	7.2	0.41
1976/77	26	122	125,778	958,069 ^a	17,748	7	7.7	0.61
1977/78	15	73	119,641	726,382	10,551	11	6.1	1.00
1978/79	33	226	520,168	3,093,859	31,142	17	5.9	1.27
1979/80	68	288	738,859	4,453,557	41,753	18	6.0	0.92
1980/81	51	358	821,071	5,080,632	54,114	15	6.2	0.96
1981/82	56	341	515,882	3,168,689	51,776	10	6.1	1.40
1982/83	63	157	271,237	1,683,654	30,894	9	6.2	3.20
1983-1999			NO FISHERY					

NA=Not Available.

^aCombined 6 1/2 inch and 7 1/2 inch seasons.

Table 3-2. Chignik District Tanner crab *Chionoecetes bairdi* catch and effort statistics, 1968-1999.

Year	Vessels	Number Landings	Number Crab ^a	Number Pounds ^a	Pots Lifted	Average Weight	CPUE	Price per Pound ^b (\$)	Percent Recruits ^c
1968	NA	NA	NA	21,100	NA	NA	NA	NA	NA
1969	NA	NA	NA	38,100	NA	NA	NA	NA	NA
1970	NA	NA	NA	2,800	NA	NA	NA	NA	NA
1971	NA	NA	NA	152,300	NA	NA	NA	NA	NA
1972			Harvest Confidential						
1973	15	56	297,363	747,788	8,080	2.5	51	0.16	NA
1974	25	115	1,586,560	4,054,873	28,083	2.6	57	0.2	NA
1974/75	25	91	1,438,508	3,649,444	22,675	2.5	63	0.14	NA
1975/76	35	288	2,724,509	6,926,161	52,381	2.5	52	0.19	NA
1976/77	21	141	2,098,226	5,672,919	40,604	2.7	52	0.33	NA
1977/78	32	140	1,725,042	4,693,830	38,414	2.8	45	0.42	NA
1978/79	39	126	926,253	2,536,105	28,378	2.7	33	0.55	NA
1979/80	42	155	2,340,004	3,517,920	54,627	2.6	25	0.54	NA
1980/81	24	112	1,534,847	3,653,723	44,022	2.4	35	0.64	65.6
1981/82	45	174	1,343,500	3,240,576	47,830	2.4	28	1.21	64.7
1983	48	136	1,432,029	3,497,370	60,210	2.4	24	1.12	65.1
1984	17	41	269,724	659,043	14,665	2.4	18	1.09	33.5
1985	15	27	162,448	375,476	15,708	2.3	10	1.42	51.2
1986	6	12	85,697	188,162	7,435	2.2	12	1.97	85.3
1987	10	20	89,329	195,060	7,052	2.2	13	2.28	90.1
1988	6	11	87,148	183,111	6,544	2.1	13	2.33	91.3
1989	6	34	142,470	323,120	9,845	2.3	15	3.05	95.0
1990-1999			No commercial fishery has occurred since 1989.						

^aIncludes deadloss.^bComputed only for live poundage where price information was available.^cRecruits = newshell male crab from 137 to 163 mm carapace width.

Table 3-3. Tanner crab *Chionoecetes bairdi* catch and effort statistics for South Peninsula District, 1967-1999.

Year	Number Vessels	Number Landings	Number Crab ^a	Number Pounds ^a	Pots Lifted	Average Weight	CPUE	Price per Pounds ^b (\$)	Percent Recruits
1967	NA	NA	NA	3,100	NA	NA	NA	NA	NA
1968	NA	155	36,835	110,610	NA	3	NA	NA	NA
1969	NA	173	221,946	606,178	NA	2.7	NA	NA	NA
1970	NA	NA	NA	2,093,600	NA	NA	NA	NA	NA
1971	17	242	813,610	2,140,585	NA	2.6	NA	0.10	NA
1972	NA	NA	NA	3,618,900	NA	NA	NA	NA	NA
1973	36	390	2,213,006	5,615,563	53,573	2.5	41	NA	NA
1974	44	386	3,504,668	8,300,578	58,444	2.4	60	NA	NA
1974/75	44	131	2,053,530	5,195,800	38,153	2.5	54	0.14	NA
1975/76	36	288	2,724,509	6,926,161	52,381	2.5	52	0.20	NA
1976/77	28	389	2,524,565	6,773,838	63,143	2.7	40	0.32	NA
1977/78	36	374	2,847,948	7,446,270	70,587	2.6	40	0.40	NA
1978/79	48	332	3,267,122	8,684,408	82,374	2.7	40	0.51	66
1979/80	61	363	2,581,544	6,961,251	96,989	2.7	27	0.54	40
1980/81	43	268	1,274,539	3,294,106	59,560	2.6	21	0.58	35
1981/82	72	365	1,815,060	4,589,042	81,008	2.5	22	1.05	50
1983	82	230	1,144,096	2,863,798	70,524	2.5	16	1.20	55
1984	61	207	775,472	1,789,883	50,726	2.3	15	1.04	30
1985	52	184	1,097,182	2,549,686	47,465	2.3	23	1.42	73.0
1986	74	187	1,589,759	3,781,950	65,078	2.4	24	1.72	73
1987	54	106	950,300	2,400,784	37,511	2.5	25	2.03	56
1988	73	148	1,359,371	3,328,809	52,516	2.4	26	2.20	79
1989	65 ^c	87	433,112	1,055,082	27,958	2.4	15	2.70	53
1990-1999			No commercial fishery has occurred since 1989.						

^aIncludes deadloss.

^bComputed for live crab.

^cOne additional vessel was registered but did not fish in the District.

Table 3-4. Commercial catch and effort for the deepwater Tanner crabs *Chionoecetes tanneri*, Alaska Peninsula District, 1994-1999.

Year	Vessels	Landings	Number Crab ^a	Number Pounds ^a	Number of Pot Lifts	CPUE	Average Weight	Price Per Pound (\$)	Deadloss
1994					Confidential				
1995	6	34	600,984	947,014	7,143	81	1.6	1.40	24,473
1996	7	35	335,234	553,028	19,285	17	1.6	1.00	43,643
1997					No commercial fishing effort				
1998					No commercial fishing effort				
1999					No commercial fishing effort				

^aDeadloss included.

Table 3-5. Dungeness crab *Cancer magister* harvest statistics, Alaska Peninsula District, 1968 - 1999.

Year	Vessels	Landings	Number of Crabs	Number of Pounds ^a	Pots Lifted	CPUE	Average Weight	Price per Pound (\$)
1968	N/A	N/A	434,142	1,259,013	N/A	N/A	2.9	N/A
1969	N/A	N/A	411,000	1,056,000	N/A	N/A	N/A	N/A
1970	N/A	N/A	4,200	13,000	N/A	N/A	N/A	N/A
1971	N/A	N/A	3,900	11,000	N/A	N/A	N/A	N/A
1972	N/A	N/A	29,400	65,000	N/A	N/A	N/A	N/A
1973			C o n f i d e n t i a l					
1974			N o C o m m e r c i a l F i s h i n g E f f o r t					
1975			N o C o m m e r c i a l F i s h i n g E f f o r t					
1976			N o C o m m e r c i a l F i s h i n g E f f o r t					
1977			N o C o m m e r c i a l F i s h i n g E f f o r t					
1978			N o C o m m e r c i a l F i s h i n g E f f o r t					
1979			C o n f i d e n t i a l					
1980			N o C o m m e r c i a l F i s h i n g E f f o r t					
1981/82			C o n f i d e n t i a l					
1982/83	16	79	357,955	779,600	59,265	6	2.2	0.75
1983/84	18	132	565,430	1,207,128	113,061	5	2.1	0.97
1984/85	13	99	294,191	647,497	106,056	3	2.1	1.38
1985/86	7	31	239,202	488,107	52,117	5	2.0	1.26
1986/87	6	28	87,925	180,261	30,280	3	2.0	1.05
1988			C o n f i d e n t i a l					
1989			C o n f i d e n t i a l					
1990	4	10	31,074	65,806	5,225	6	2.1	1.53
1991	7	18	39,069	80,248	12,813	3	2.1	1.24
1992			C o n f i d e n t i a l					
1993	3	15	127,979	273,811	15,675	8	2.1	0.79
1994	4	24	134,429	277,639	27,950	5	2.1	1.01
1995			C o n f i d e n t i a l					
1996	4	9	47,824	112,388	15,306	4	2.3	1.01
1997	7	17	120,935	240,128	42,324	3	2.0	2.06
1998	3	7	48,629	96,073	14,800	3	2.0	1.50
1999			C o n f i d e n t i a l					

Fishery information confidential when less than three vessels participated.

^aIncludes deadloss.

Table 3-6. South Peninsula and Chignik District shrimp harvest statistics, 1968-1999.

SOUTH PENINSULA					CHIGNIK			
Year	Vessels	Landings	Number Pounds	Price per pound (\$)	Vessels	Landings	Number Pounds	Price per Pound (\$)
1968			Confidential				Confidential	
1969			Confidential				Confidential	
1970	4	173	4,398,800	0.04			890,705	
1971			Confidential				Confidential	
1972/73			14,740,801	0.07			4,829,117	
1973/74	12	347	19,987,246	0.07	33	277	51,673,788	0.08
1974/75	22	387	26,145,720	0.08	37	323	23,392,352	0.08
1975/76	24	326	20,044,112	0.09	50	334	24,435,480	0.08
1976/77	19	424	37,148,932	0.09	48	303	27,232,630	0.10
1977/78	48	409	45,003,794	0.13	50	271	26,512,791	0.13
1978/79	23	108	9,418,276	0.16	40	201	23,257,869	0.17
1979/80	10	41	3,134,367	0.21	35	195	23,722,330	0.23
1980/81			Closed		54	148	12,843,270	0.29
1981/82			Closed		3	4	70,948	0.27
No commercial fishing activity has occurred in these districts since 1981/82.								

Table 3-7. Harvest statistics of octopus in the state and federal waters of the Alaska Peninsula District, 1980-1999.

Year	State waters			Federal waters			Total				
	Vessels	Landings	Pounds Harvested	Vessels	Landings	Pounds Harvested	Vessels ^a	Landings	Pounds Harvested	Price per Pound	Fishery value (\$)
1980-1985						Confidential					
1986-1987						No fishing					
1988	22	58	9,946	16	132	34,622	31	190	44,568	0.92	41,003
1989	12	41	5,309	15	82	9,581	23	123	14,890	1.00	14,890
1990	7	45	6,746	14	33	2,393	19	78	9,139	1.00	9,139
1991	18	72	15,103	14	36	4,392	29	108	19,495	1.00	19,495
1992	38	183	38,651	39	100	6,579	72	283	45,230	1.00	45,230
1993	9	23	9,017	28	59	3,007	35	82	12,024	1.00	12,024
1994	16	36	15,621	8	14	1,171	23	50	16,792	0.59	9,907
1995	14	49	5,939	13	18	1,597	24	67	7,536	0.45	3,391
1996	16	52	11,258	11	22	1,329	26	74	12,587	0.49	6,168
1997	22	143	48,286	13	20	1,160	34	163	49,446	0.49	24,229
1998	9	15	4,048	7	22	2,592	15	37	6,640	0.53	3,519
1999	7	10	417	5	19	1,187	12	29	1,604	0.50	802

^a Some vessels made landings in both state and federal waters.

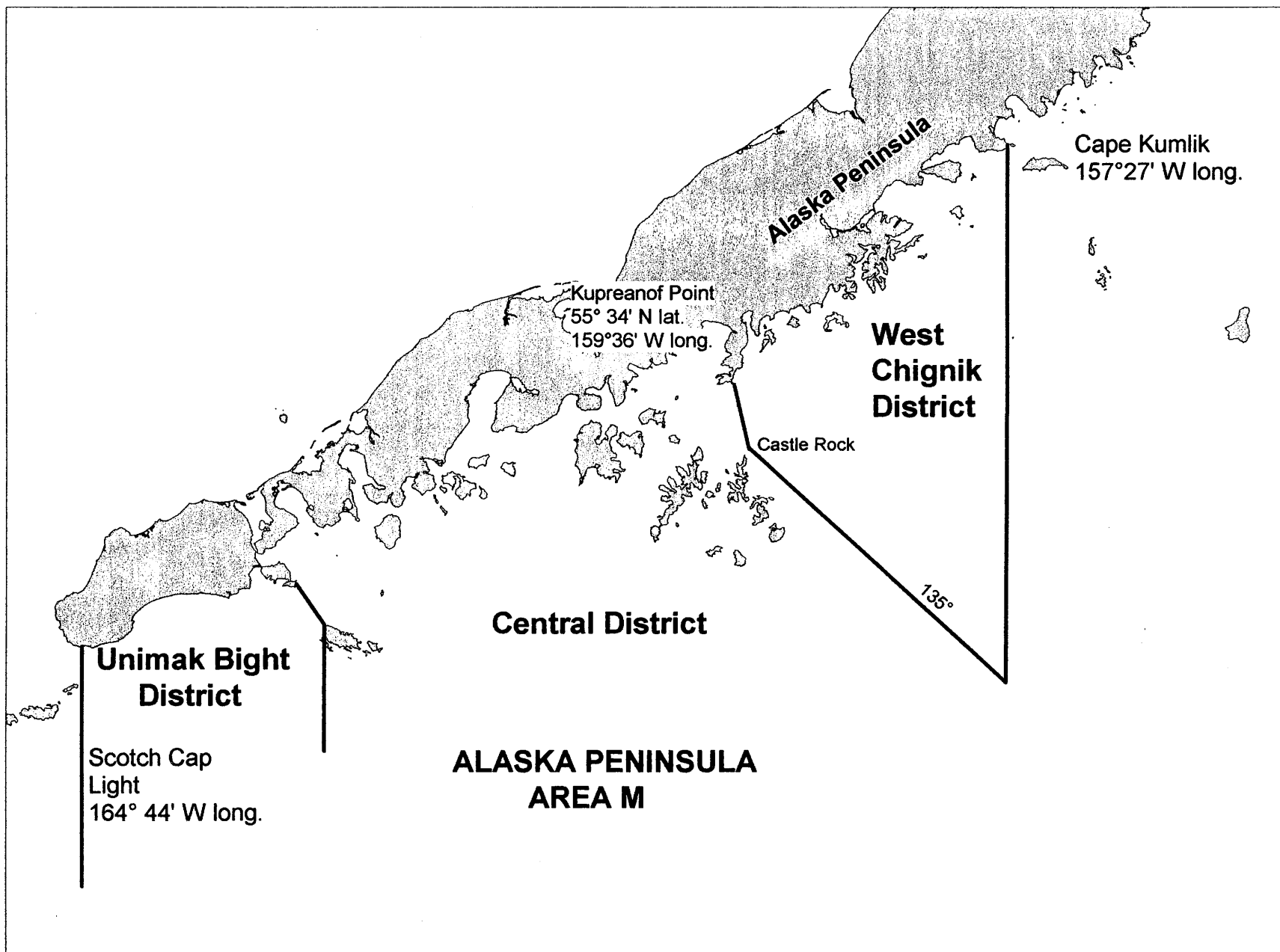


Figure 3-1. Unimak Bight, Central, and Chignik Districts of king crab Registration Area M.

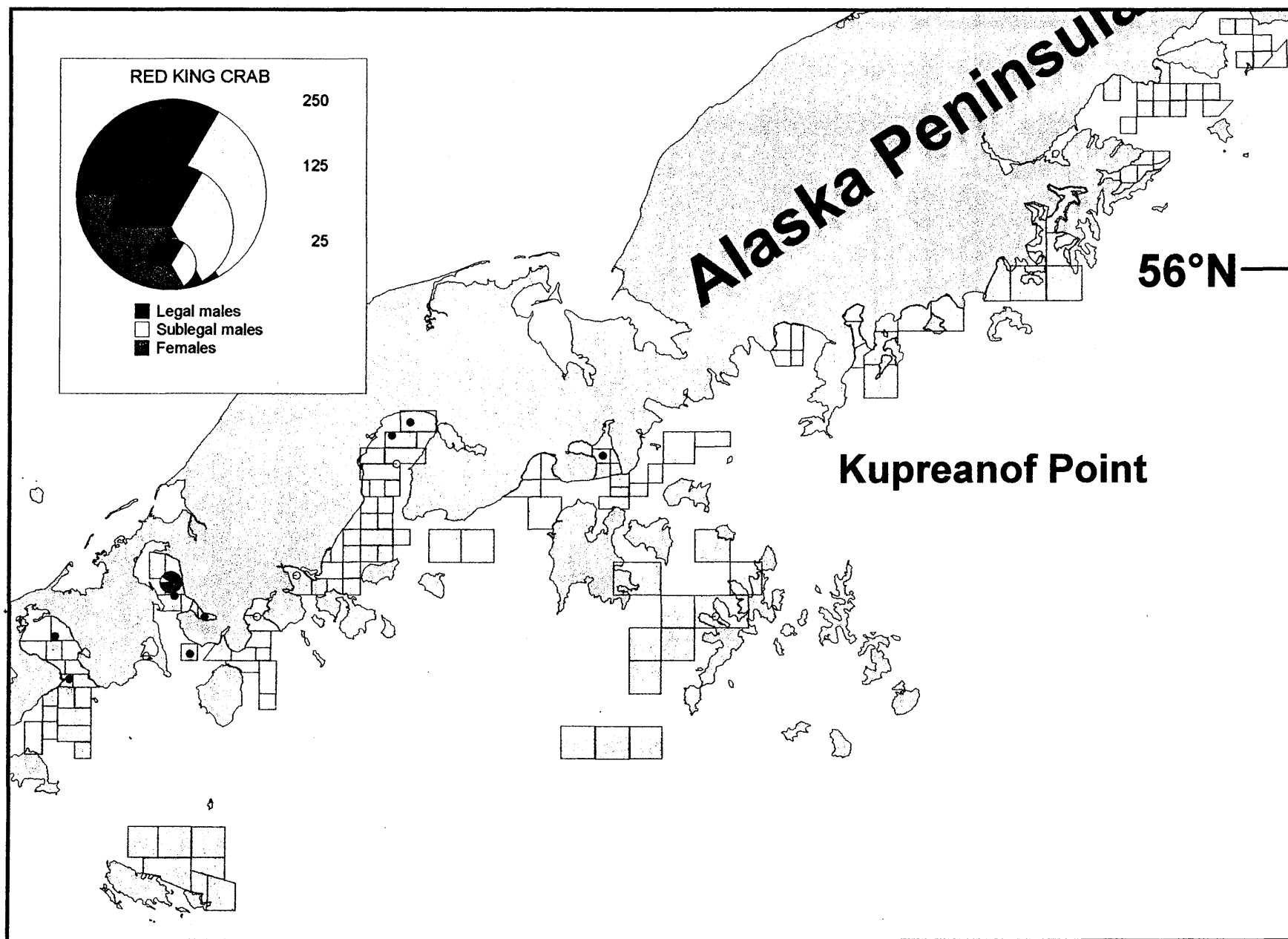


Figure 3-2. The number of red king crab per kilometer towed from the 1999 Alaska Peninsula trawl survey.

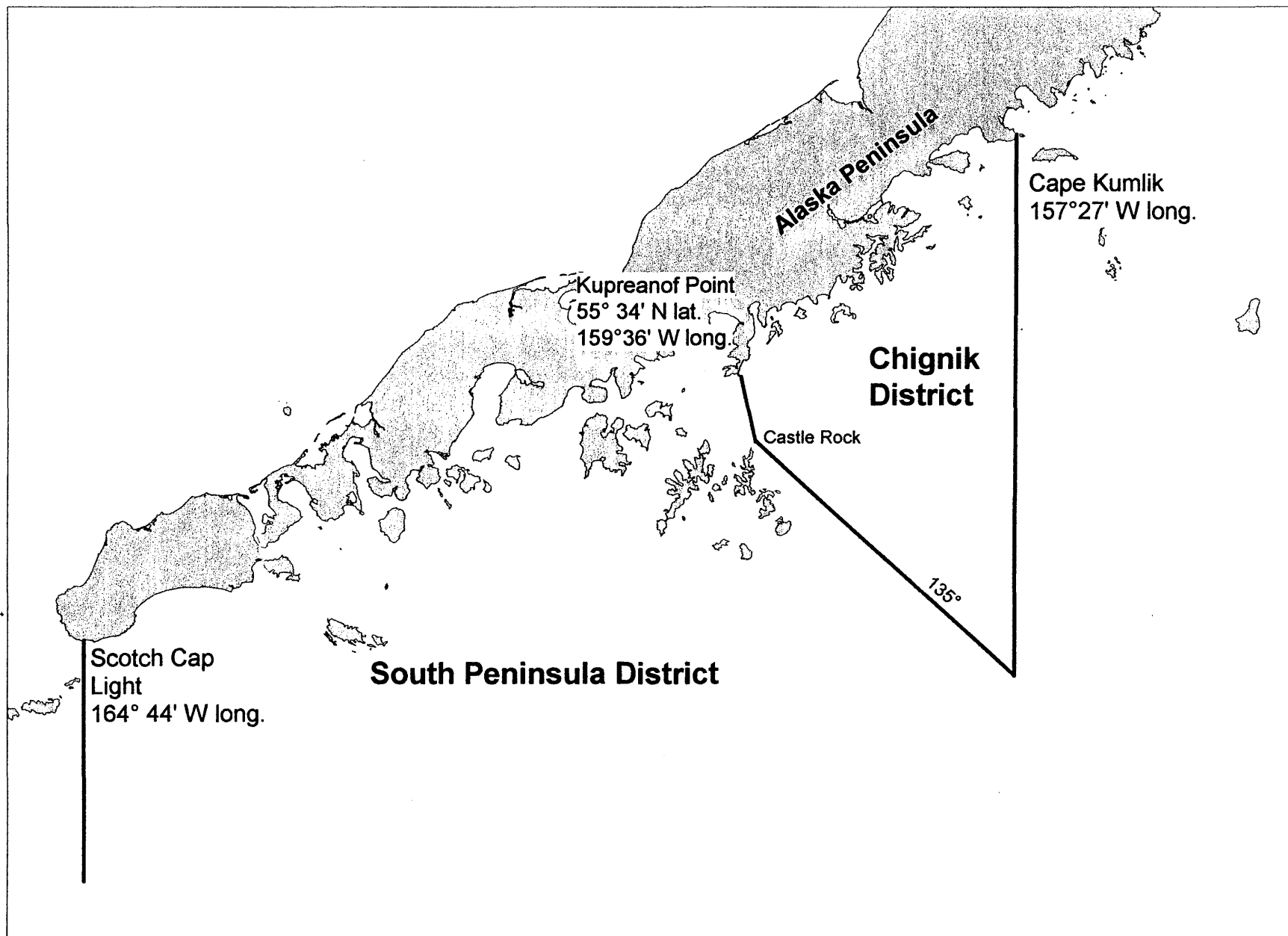


Figure 3-3. Chignik and South Peninsula Districts of Tanner crab Registration Area J.

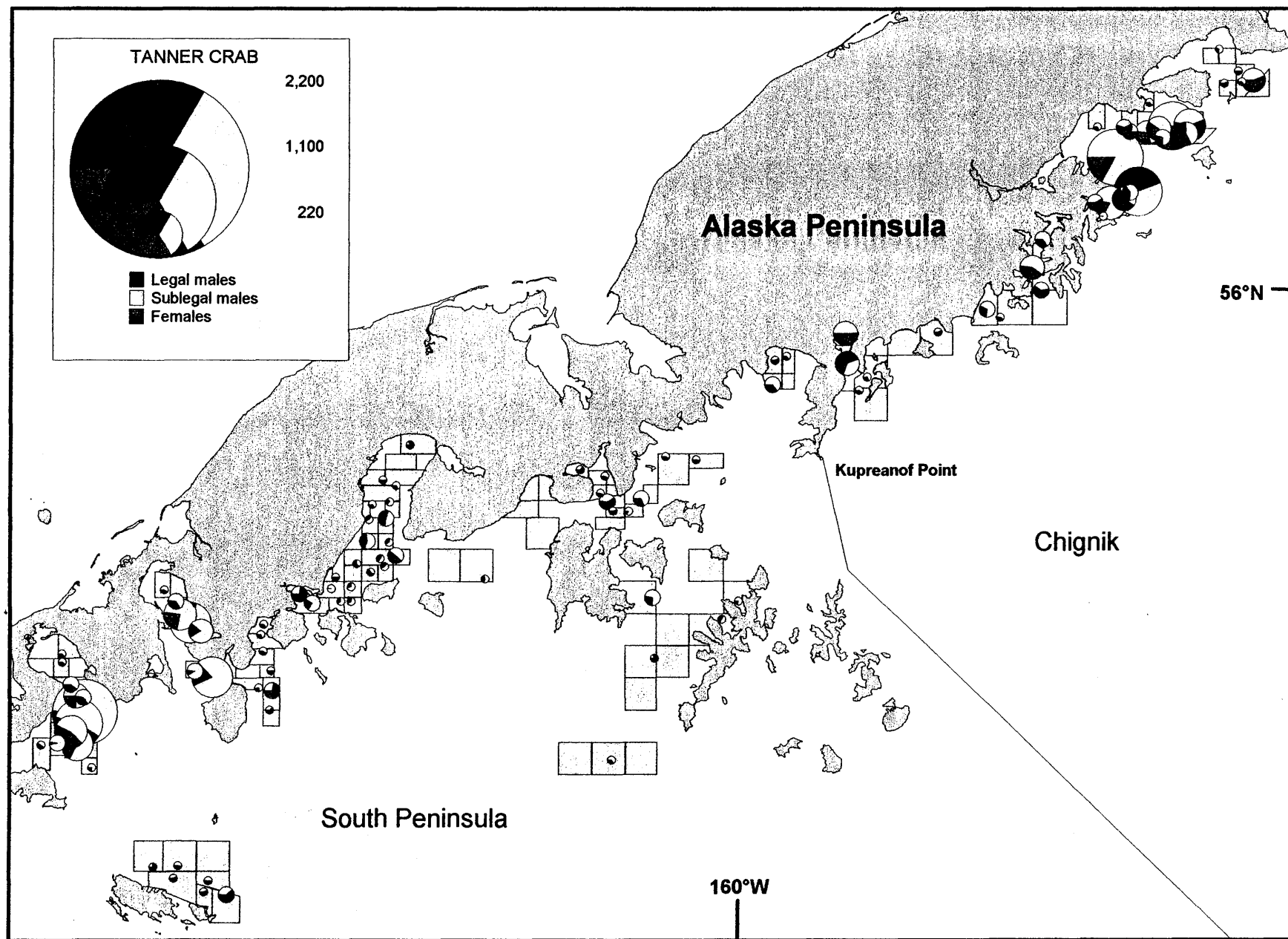


Figure 3-4. The number of Tanner crab per kilometer towed from the 1999 Alaska Peninsula trawl survey.

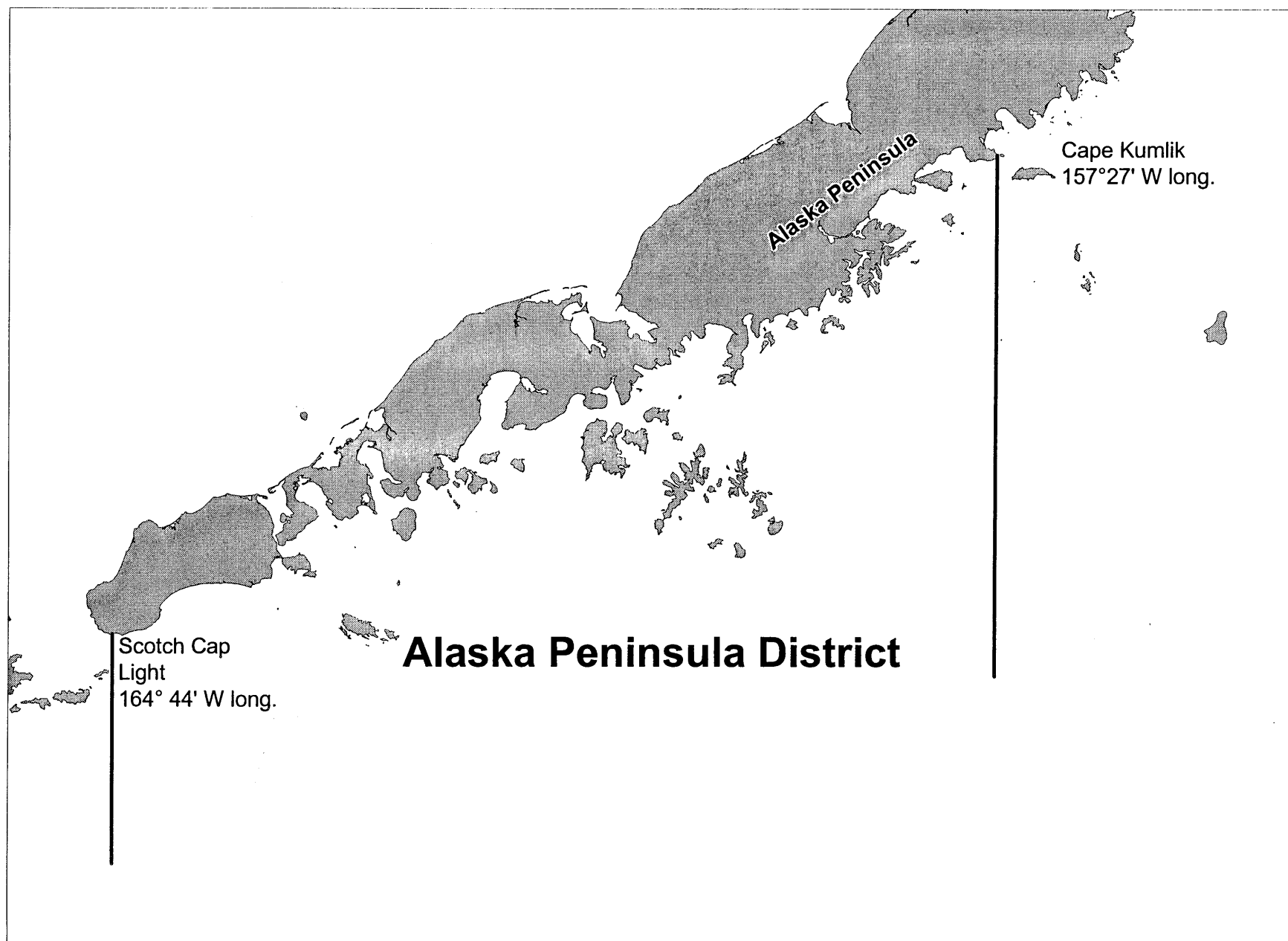


Figure 3-5. Alaska Peninsula District of Dungeness crab Registration Area J.

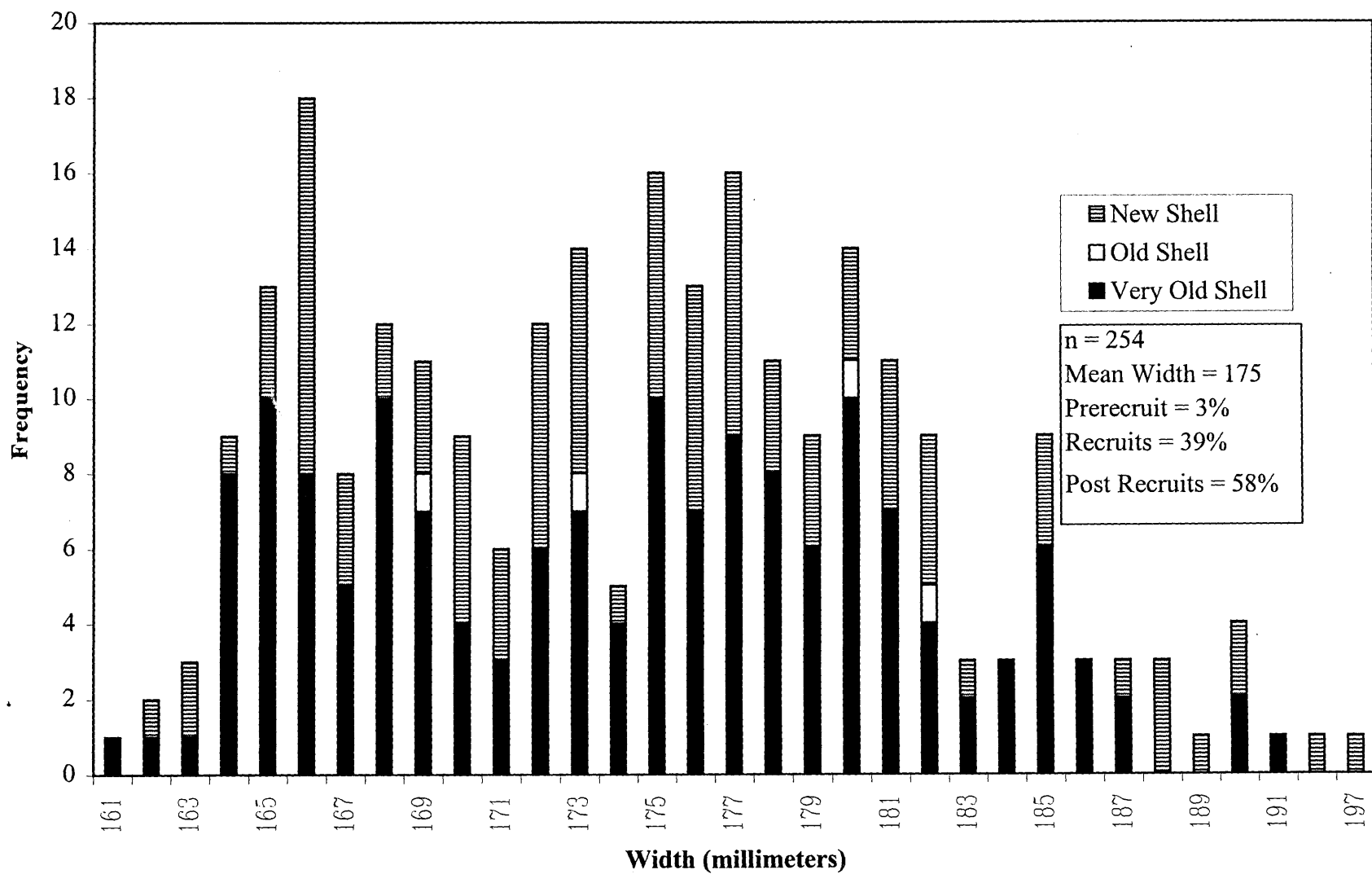


Figure 3-6. Alaska Peninsula District commercial Dungeness width frequencies, including shell condition, 1998/1999.

ANNUAL MANAGEMENT REPORT FOR THE
SHELLFISH FISHERIES OF THE
ALEUTIAN ISLANDS

By

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ALEUTIAN ISLANDS KING CRAB MANAGEMENT AREA

Description of Area

The Aleutian Islands king crab registration area, Area O, has as its eastern boundary the longitude of Scotch Cap Light (164° 44' W long.), its western boundary the U.S.-Russia Convention line of 1867, and its northern boundary a line from the latitude of Cape Sarichef (54° 36' N lat.) to 171° W long., north to 55° 30' N lat. and west to the U.S.-Russia Convention line of 1867 (Figure 4-1).

ALEUTIAN ISLANDS RED KING CRAB

Historic Background

Historically, the red king crab *Paralithodes camtschaticus* resource in the Aleutian Islands was harvested in two registration areas. The Adak area consisted of those waters in the Aleutian Islands west of 171° W long. while the Dutch Harbor registration area encompassed waters east of 171° W longitude. In addition, as the fleet moved westward, a third management area, Area S was established for the waters around Amchitka Island and the Petrel Banks. Area S was created in 1967 and was merged into Area R in 1978 (ADF&G 1991). At the March 1996 BOF meeting, the BOF established the Aleutian Islands king crab registration area (Area O) by combining the existing Dutch Harbor and Adak areas. The BOF adopted this change because of the increasing importance of golden king crab fisheries in the Aleutian Islands and a desire to improve management of those commercially important stocks. Combining the Adak and Dutch Harbor areas was not expected to impact management of red king crabs in the Aleutian Islands (ADF&G 1999a).

Domestic fisheries for red king crabs in both the Adak and Dutch Harbor registration areas began in 1961, with effort and harvest increasing rapidly in both areas. The Adak area reached a peak harvest of 21.2 million pounds in 1964/65, while maximum production in the Dutch Harbor area was reached in 1966/67 with a harvest of 33 million pounds. Fluctuating harvest levels from one year to the next characterized the fisheries in the Dutch Harbor and Adak areas, and by the 1982/83 season the Dutch Harbor fishery had declined to a harvest of 430,000 pounds. Commercial fishing for red king crabs in that portion of the Aleutian Islands was closed on an annual basis after the 1982/83 season (Table 4-1, Figure 4-2). The Adak fishery remained open until the 1995/96 season when only 39,000 pounds were harvested (Table 4-1, Figure 4-2). The Aleutian Islands red king crab fishery had a maximum fishery value of nearly \$20 million (Table 4-2).

1998/99 Commercial Fishery

Since the 1995/96 season, commercial fishing has occurred only during the 1998/99 season. In order to assess the status of red king crab stocks in portions of the Aleutian Islands where the ADF&G has gained little recent abundance information, the Aleutian Islands king crab

registration area was opened to commercial red king crab fishing on November 1, 1998. A limited commercial fishery was opened in two areas of the Aleutian Islands with the provision that animals not harvested be tagged and released; in addition, vessel operators were required to document all red king crab fishing activities in a pilot house log book. These GHs were set using historic catch information. East of 179° W long., a GH of 5,000 pounds was established and west of 179° E. long., a GH of 10,000 pounds was set. Closed waters included the Petrel Banks, or the area between 179° E. long. and 179° W longitude. The ADF&G did not open the Petrel Banks area in 1998/99 since prior efforts had provided some population data from that area (Byersdorfer 1998).

Three vessels registered to harvest red king crabs in the Aleutian Islands during the 1998/99 season, but only one recorded any landings. The GH was not reached in either area open and the fishery was closed by emergency order on July 31, 1999. Observers were required on all vessels participating in the 1998/99 fishery.

1999 Subsistence Fishery

In addition to commercial fisheries, subsistence and sport fisheries have targeted red king crabs in the vicinity of Unalaska Island for a number of years. To obtain subsistence harvest data, the ADF&G has periodically required fishers to obtain a harvest permit and report. Few of the permits were returned, and the program was discontinued in 1994. On average, 15 returned permits were returned per year and they accounted for an average of 135 king crab annually.

To address conservation concerns for the Eastern Aleutian Islands red king crab stock, the BOF took action at its March 1999 meeting regarding the subsistence and sport king crab fishery in that portion of the Aleutian Islands between 168° and 164°44' W longitude. Regulations closing the sport fishery and reducing the daily bag limit of subsistence king crabs from six to one crabs per day were adopted by the BOF. The BOF also adopted regulations requiring that subsistence king and Tanner crab fishers in the Aleutian Islands between 168° and 164°44' W long. obtain a subsistence permit before commencement of fishing operations.

In 1999, ADF&G staff in Dutch Harbor issued 180 subsistence permits and harvest reports, of which 71 or 39% were returned. The 71 returned permits accounted for a harvest of 707 king crabs (Table 4-3). Estimates generated from the subsistence harvest reports indicate that approximately 1,455 king crab were taken and harvest ranged from zero to 131 king crab per permit. The majority of subsistence caught king crabs were taken in Illiuliuk and Captains Bays and most of the king crab harvest occurred prior to the end of July. These harvest figures are substantially less than estimates generated by a 1994 survey of 15.1% of households in Unalaska, where 6,892 king crab were estimated to have been taken (ADF&G 1999b).

Fishery Management and Stock Status

Recent harvest goals have been based on historic catch data, although throughout the 1970s and into the mid 1980s, guideline harvest level ranges were established using a blend of pot survey results and fisheries data. Guideline harvest levels were often modified inseason based on

fishery performance. Historic fishery GHGs set in the late 1970s ranged from 8.0 to 26 million pounds for Dutch Harbor and from 0.5 to 3.0 million pounds in Adak (ADF&G 1978).

When both the red and golden king crab seasons are open concurrently, red king crabs may be retained from longlined brown king crab pots provided the pots are fished in waters deeper than 100 fathoms. Otherwise, red king crabs may only be taken from red king crab pots fished in a single line fashion. There is no pot limit for king crab fisheries in the Aleutian Islands. Observers have been required on all crab catcher-processor vessels since 1988 and on catcher vessels targeting red and golden king crabs in the Aleutian Islands since 1995. Observer coverage on golden king crab vessels provides information about red king crab bycatch from that fishery, although red king crab catch in golden king crab gear is minimal due to the limited overlap in distribution of the two species. In the directed red king crab fishery, observer coverage provides data on retained and non-retained crabs as well as data related to fishing patterns.

Most shellfish research in the Aleutian Islands has been directed at crab stocks inhabiting the eastern Aleutian Islands. Systematic pot surveys were conducted in this area during the 1970s and early to mid-80s. A number of red king crab tagging studies were also conducted during this time period. Bottom trawl surveys of the waters around Unalaska Island were conducted in 1991, 1994, 1995 and 1999. Recent bottom trawl surveys have not captured large numbers of king crabs. In 1995, only two red king crabs were caught, thus no population estimate could be generated. During the 1999 survey, 72 red king crabs were caught, one of which was a legal male. All others were pre-recruit males and small females captured in a single tow. This catch, while encouraging, does not appear to constitute a rebuilding event.

In 1996 and 1997, a catcher-processor was permitted to target red king crabs on the Petrel Banks during their directed golden king crab fishing. The goals of this project were to enumerate, tag and collect biological data from all red king crabs captured and to recapture tagged individuals. While the tagging was too limited to provide quantitative stock assessment data, it did provide some data related to migration, molting cycle and seasonal distribution (Byersdorfer 1998).

A total of 926 crabs were tagged over a two year period along the north side of Amchitka Island and south side of Semisopochnoi Island. Among captured crabs, 440 were legal males and 160 were females; 89% of legal crabs were new shell. Recovery efforts yielded 15 tagged crabs, six of which were legal males.

The limited data available for red king crabs in the western Aleutian Islands do not indicate that stocks are recovering in that area. Currently, there is no reason to believe that red king crab stocks in the Aleutian Islands will recover to commercially exploitable levels in the immediate future.

Given limited stock status information, future effort will be directed towards obtaining stock status information and developing a conservative rebuilding and management plan through the BOF and Crab Plan Team process. The ADF&G intends to close the fishery for the 1999/2000 season until the Crab Plan Team has reviewed stock assessment and management options. The ADF&G will also develop, for BOF and public review, a harvest strategy to provide stock rebuilding measures and a minimum guideline harvest threshold similar to the Eastern Bering Sea Tanner crab *Chionoecetes bairdi* harvest strategy.

Literature Cited

- Alaska Department of Fish and Game (ADF&G). 1978. Westward region shellfish report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries. Kodiak.
- Alaska Department of Fish and Game (ADF&G). 1991. Westward region shellfish report to the BOF. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K91-4, Kodiak.
- Alaska Department of Fish and Game (ADF&G). 1999a. Annual management report for the shellfish fisheries of the Westward Region, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K99-49, Kodiak.
- Alaska Department of Fish and Game (ADF&G). 1999b. Customary and traditional use worksheet for marine invertebrates, including king and tanner crab: Alaska Peninsula-Aleutian Islands Area *in* Westward Region Report to the Alaska Board of Fisheries 1999, Kodiak.
- Byersdorfer, Susan. 1998. A summary of tagging data collected by observers onboard the F/V Patricia Lee during the Aleutians brown king crab fishery from November 1996 to February 1997. Alaska Department of Fish and Game, Division of Commercial, Regional Informational Report 4K98-22.

ALEUTIAN ISLANDS GOLDEN KING CRAB

Historic Background

The golden king crab *Lithodes aequispinus* fishery in the Aleutian Islands is unique among Westward Region king crab fisheries in that it has never failed to open due to low stock abundance. In addition, golden king crabs inhabit depths greater than where other commercially exploited king crabs are typically found (Blau et al. 1996). The depths and steep bottom topography in the inter-island passes inhabited by golden king crabs necessitates the use of longline rather than single pot gear. There are no other major king crab fisheries in the Westward Region where longlined pot gear is the only legal gear type.

Historically, golden king crabs were taken as incidental bycatch in the Adak (west of 171° W long.) and Dutch Harbor registration area (east of 171° W long.) red king crab *Paralithodes camtschaticus* fisheries. One landing of golden king crabs was reported from the Adak area during the 1975/76 season, but directed fishing for golden king crabs did not occur in either management area until the 1981/82 season (ADF&G 1984). From the 1981/82 season until the 1996/97 season, the golden king crab resource in the Aleutian Islands was harvested in two directed fisheries occurring in the Adak (Area R) and Dutch Harbor (Area O) registration areas.

During the 1981/82 season, 14 vessels landed 1.2 million pounds of golden king crabs in 76 deliveries from the Adak area. By the following season, harvest had reached eight million pounds with 99 vessels participating in the fishery. Between 1981 and 1995, an average of 49 vessels participated in the Adak golden king crab fishery, harvesting an average of 6.9 million pounds annually (Table 4-4, Figure 4-3). Peak harvest in the Adak fishery occurred during the 1986/87 season when 14.7 million pounds of golden king crabs were harvested for an ex-vessel value of \$42.7 million (Table 4-5). No stock assessment of the golden king crab population was performed in the Adak area and the fishery was managed based on size, sex and season

restrictions. Catches were monitored inseason (ADF&G 1999). The majority of golden king crabs harvested in the Adak area were taken in the North Amliia and Petrel Banks Districts; however, significant harvest also occurred in the Western Aleutian District.

From the 1981/82 season to the 1995/96 season, average weight of golden king crabs harvested in the Adak area fishery declined from 5.1 to 4.2 pounds and catch rate declined from 17 to 5 legal golden king crabs per pot pull (Figure 4-3). In July of 1985, the BOF adopted a regulation reducing the minimum legal size for golden king crabs from 6.5 to 6.0 inches in carapace width. Decreasing the legal size for golden king crabs in this area resulted in an expected decrease in average weight of legal crabs harvested and increased catch and catch per pot pull during the 1985/86 and 1986/87 seasons. This regulation change did not, however, reverse the trend of slowly declining catch rates in the area west of 171° W longitude.

Initial catches of golden king crabs in the Dutch Harbor area were similar to those observed in the Adak area fishery (ADF&G 1984). Harvest was incidental to the red king crab fishery and effort in the fishery only increased as red king crab stocks decreased in abundance. Six vessels harvested approximately 115,000 pounds of golden king crabs during the 1981/82 Dutch Harbor red king crab season (Table 4-4). By the following season, 49 vessels were participating in the directed golden king crab fishery; these vessels accounted for a harvest of 1.2 million pounds of golden king crabs. Between 1981 and 1995, an average of 18 vessels harvested approximately 1.5 million pounds of golden king crabs annually (Figure 4-4). Peak golden king crab harvest in the Dutch Harbor area occurred during the 1995/96 season when 1.9 million pounds were harvested for an exvessel value of \$5.2 million (Table 4-5). The Dutch Harbor stock was harvested primarily in the Islands of Four Mountains and Yunaska Island area.

In general, average weight of golden king crabs harvested in the Dutch Harbor area declined during the period 1981 to 1995. Average weight ranged from a high of 7.6 pounds in the 1983/84 season to 4.1 pounds during the 1992/93 season. Fishery performance measured in number of legal golden king crabs per pot pull has slowly declined throughout the history of this fishery. Catch per pot pull reached a peak of 14 legal crabs per pot during the 1984/85 season and was lowest during the 1994/95 season when it was six legal crabs per pot pull (Figure 4-4). Golden king crabs in the Dutch Harbor area were not surveyed for abundance prior to 1991 and the fishery was managed based on a historical average catch of 1.5 million pounds (ADF&G 1999). In 1984, the BOF adopted an ADF&G staff proposal to lower the legal size for golden king crab in the Dutch Harbor area from 6.5 inches to 6.0 inches carapace width and to establish the area as a permit fishery.

At its March 1996 meeting, the BOF chose to restructure management of king crabs in the Aleutian Islands. Formerly, the Aleutian Islands king crab populations had been managed using the Adak and Dutch Harbor registration areas that were established for red king crab fisheries. With the decline of red king crab fisheries in the Aleutian Islands during the 1970s and 1980s and increasing importance of the golden king crab fishery, the BOF felt that king crab management areas in the Aleutian Islands should be re-designated to more accurately reflect current golden king crab stock distribution and patterns in fishing effort.

A public proposal submitted at that meeting suggested that the eastern boundary of the Adak area be moved east to include the western portion of the Dutch Harbor area and the productive golden king crab stocks in the Yunaska and Islands of Four Mountains area. This proposal was intended

to effectively extend the length of time that that portion of the stock would have been available for harvest. As an alternative to this proposal, the ADF&G recommended moving the boundary of the Adak area west to 174° W long., thereby placing some of the most productive golden king crab waters from the Adak area in the Dutch Harbor registration area. Under this scenario, the most productive stock would not be split as it had been in the past, and would be managed as a distinct unit.

The BOF elected to eliminate the Adak and Dutch Harbor areas entirely since they were originally established for red king crab fisheries that no longer sustain harvest and they were not based on current golden king crab stock distribution in the Aleutian Islands. In addition, the BOF directed the ADF&G to manage the golden king crab stocks of the Aleutian Islands east and west of 174° W long. as two distinct stocks. Under the prior two-registration area regime, golden king crabs in the Segum area were harvested at a higher rate than those crabs in the adjacent Yunaska Island and Islands of Four Mountains area. The BOF directed the ADF&G to manage those golden king crabs in the Segum area at the lower exploitation rate present in the east. To implement these goals, the BOF stipulated that a conservative management plan be initiated, and that all vessels registered for the fishery carry an observer onboard for all of their fishing activities.

The initial golden king crab fishery in the new Area O king crab registration area occurred in 1996/97. Compared to prior combined Adak and Dutch Harbor area fisheries, there was reduced effort and harvest during the 1996/97 fishery. Eighteen vessels harvested 5.8 million pounds, down from 28 vessels taking 6.9 million pounds in 1995/96. This reduction in effort is likely due to the departure of vessels for the Bristol Bay red king crab season which re-opened to commercial fishing in 1996 for the first time since 1993. The eastern portion of Area O closed by emergency order on December 25, 1996 with a harvest of 3.3 million pounds, while the western portion was open for the entire registration year with a harvest 2.6 million pounds.

During the 1996/97 fishery, the harvest rate east of 174° W long. was six legal crabs per pot pull with an average weight of 4.5 pounds per legal crab. In that portion of Area O west of 174° W long., fishery performance was six legal crabs per pot pull with an average weight of 4.2 pounds per legal crab (Table 4-4). East of 174° W long., most fishing effort was concentrated in the area around Yunaska Island and the Islands of Four Mountains with some effort in the Segum and Amukta pass areas. West of 174° W long., most harvest occurred between Amchitka pass and Buldir Island. The 1996/97 golden king crab fishery in the Aleutian Islands had an estimated ex-vessel value of \$12.5 million (Table 4-5).

In the Aleutian Islands golden king crab fishery the long term trend in fishing effort is one of declining number of vessels registered per season and increasing number of pots registered per vessel (Figure 4-5). With the legalization of long line gear in 1986, it became more common for vessels to specialize in fishing for golden king crabs and these vessels were able to more efficiently operate gear. The long line vessels tended to fish in the Aleutian Islands almost exclusively and forego some Bering Sea crab fisheries (ADF&G 1987).

1998/99 Fishery

The 1998/99 Aleutian Islands (Area O) golden king crab fishery opened by regulation at 12:00 noon, September 1. The 1998/99 GHLL was reduced from 5.9 million pounds to 5.7 million pounds. The GHLL was split east and west of 174° W long.; 3.0 million pounds were allocated for harvest east of 174° W long. and the remaining 2.7 million pounds was allocated to the western portion of the management area. The 1997 ADF&G Aleutian Islands golden king crab survey (Blau et al. 1998) indicated that a 200,000 pound GHLL reduction was necessary in order to comply with the overfishing definition specified in Amendment 7 to the Fishery Management Plan for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands (NPFMC 1998). Sixteen vessels participated in the fishery and harvested 4,894,248 pounds, the lowest harvest since golden king crab management in the Aleutian Islands was restructured in 1996. The fishery had an exvessel value of \$9.4 million, the lowest since 1984.

Fishery East of 174° W Longitude

The commercial fishery for golden king crabs in the Aleutian Islands east of 174° W long. began with 14 vessels registered. The fleet registered 8,365 pots, or 603 pots per vessel, a 16% decrease from the 1997/98 fishery when 10,100 pots, or 777 pots per vessel were registered. In the eastern portion of the registration area, most fishing effort occurred in the vicinity of Seguam and Amukta passes and in the Yunaska Island and Islands of Four Mountains areas. Initial catch rates were just under nine legal crabs per pot lift and increased to 11 legal crabs per pot lift during the final week of the fishery. Catch rates were highest in Seguam Pass and on the north side of Yunaska Island and the Islands of Four Mountains (Table 4-6). Average catch rate for the eastern portion of Area O was nine legal crabs per pot lift, an increase of two crabs per pot from the 1997/98 catch rate of seven legal crabs per pot lift. Average weight of legal crabs was 4.4 pounds with the largest crabs encountered east of 170° W long. (Figure 4-6).

The fleet harvested 3,274,863 pounds of golden king crabs in approximately nine weeks of fishing. Landings averaged 360,874 pounds per week with a maximum of 608,944 pounds landed in a single week. Five shorebased plants, one floating processor and one catcher-processor processed golden king crabs harvested in the eastern Aleutian Islands. Prices paid for live, whole crabs ranged from \$1.82 to \$2.42 and averaged \$1.87. The fishery had an exvessel value of \$5.9 million. The eastern portion of Area O closed at 12:00 noon on November 7, 1998, thus fleet required approximately two weeks less time to harvest a product volume similar to that taken during the 1997/98 season.

Fishery West of 174° W Longitude

Fishing effort west of 174° W long. was limited to two vessels until after the closure of the Bering Sea snow crab fishery when a third vessel registered. The fleet registered 1,930 pots, or 644 pots per vessel. Western Aleutian Islands effort decreased substantially from the 1997/98 level when eight vessels registered and fished 4,690 pots, or 587 pots per vessel. Harvest west of 174° occurred primarily between Shemya and Semisopochnoi Islands and in the Delarof Islands (Table 4-6). Initial catch rates were less than nine legal crabs per pot lift and increased to 21 legal crabs per pot lift by the end of December. Catch rates were highest in the Delarof Islands. Average catch rate for the western portion of Area O was just under 12 legal crabs per pot lift, nearly double the 1997/98 catch rate of seven legal crabs per pot lift. Average weight of legal

crabs was four pounds with the largest crabs encountered west of Attu Island and in the Delarof Islands (Figure 4-6).

The fleet harvested 1,619,385 pounds of golden king crabs in approximately nine months of fishing. The GHL west of 174° W long. was not reached, however fishing activities concluded during the month of June when the fleet departed the grounds. The GHL in this area has not been reached since its inception in 1996. Landings averaged 46,983 pounds per week with a maximum of 156,240 pounds landed in a single week. Two shorebased plants and one catcher-processor processed golden king crabs west of 174° W longitude. Prices paid for live, whole crabs ranged from \$1.87 to \$2.14 per pound, yielding a fishery exvessel value of \$3.5 million.

1999/2000 Fishery East of 174° W Longitude

The 1999/2000 Aleutian Islands golden king crab fishery opened on September 1, 1999 with a GHL of 3.0 million pounds east of 174° W long. and 2.7 million pounds west of 174° W longitude. Fifteen vessels participated in the eastern fishery and deployed 9,415 pots. The fleet harvested approximately 381,000 pounds per week with an average CPUE of nine legal crabs per pot lift. The fishery closed on October 25 after 3.07 million pounds had been taken (Table 4-7). High demand for golden king crab resulted in an average exvessel price of \$3.22 per pound and a total fishery value of \$9.7 million. The fishery west of 174° W long. will remain open until further notice.

Fishery Management and Stock Status

The Aleutian Islands golden king crab fishery is managed using two sources of inseason fishery data. Processors report landed catch to ADF&G weekly or more frequently as requested. These reports are the primary source of inseason harvest information. Observers stationed on each vessel participating in the fishery report average weight and catch rate information that is used in conjunction with landed catch to develop inseason projections of fishery length.

The ADF&G surveyed a small portion of the golden king crab habitat in the Aleutian Islands during the summer of 1997. Prior to that, the ADF&G performed the only previous survey of this area in 1991 (Blau and Pengilly 1994). Only a small portion of the area in which golden king crabs are commercially important is currently surveyed. Mark-recapture data from the 1997 survey suggested that the commercial fishery was annually removing approximately 17% to 21% of the mature male crabs present in the area surveyed. The current draft of Amendment 7 to the Federal Management Plan for King and Tanner Crabs in the Bering Sea and Aleutian Islands specifies that the golden king crab stock in the Aleutian Islands is considered overfished when F exceeds 0.2 (NPFMC 1998). A fishing rate of $F=0.2$ corresponds to a mature male removal rate of approximately 18%. During the 1997/98 season, the GHL of 3.2 million pounds in the area east of 174° W long. was exceeded by approximately 300,000 pounds, so to maintain a long term average harvest at 3.2 million pounds, the 1998/99 GHL in this area was reduced to 3.0 million pounds (D. Pengilly, ADF&G, Kodiak, personal communication).

The Aleutian Islands golden king crab population is believed to be healthy despite harvest rates that are at or near the allowable maximum in some areas since much recruitment occurs at depths greater than those fished. Additionally, the area currently surveyed receives more fishing

pressure than many other areas in the entire Aleutian Islands, so golden king crabs in other less heavily fished locales are likely being harvested at rates lower than those reported here. In order to operate their gear more efficiently fishers tend to utilize the shallowest waters in which crabs may be found in abundance. Distribution of legal males extends to depths greater than those fished, so the entire population of legal males is probably not fully exploited. Currently, the ADF&G intends to survey the area around Amukta and Yunaska Islands every three years, with the next survey scheduled for the summer of 2000.

Literature Cited

- Alaska Department of Fish and Game (ADF&G). 1999. Annual management report for the shellfish fisheries of the Westward Region, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K99-49, Kodiak.
- Alaska Department of Fish and Game (ADF&G). 1987. Westward Region Shellfish Report to the BOF. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak.
- Alaska Department of Fish and Game (ADF&G). 1984. Westward Region Shellfish Report to the BOF. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak.
- Blau, S. F., L. J. Watson and I. Vining. 1998. The 1997 Aleutian Islands golden king crab survey. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K98-30.
- Blau, S. F., D. Pengilly, and D. T. Tracy. 1996. Distribution of golden king crabs by sex, size, and depth zones in the eastern Aleutian Islands, Alaska. Pages 167-185 in *High Latitude Crabs: Biology Management and Economics*. Alaska Sea Grant College Program Report no. 96-02, University of Alaska Fairbanks.
- Blau, S. F. and D. Pengilly. 1994. Findings from the 1991 golden king crab survey in the Dutch Harbor and Adak management areas including analysis of recovered tagged crabs. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K94-35.
- NPFMC. 1998. Fisheries Management Plan for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands.

ALEUTIAN ISLANDS SCARLET KING CRAB

Historic Background

Scarlet king crabs *Lithodes couesi* are currently harvested under authority of a permit issued by the commissioner of ADF&G and authorized in **5 AAC 34.082. PERMITS FOR LITHODES COUESI KING CRAB**. These permits are usually issued in conjunction with an Aleutian Islands golden king crab registration. Scarlet king crabs are typically found in waters deeper than 200 fathoms and have been taken as incidental bycatch in the golden king crab and deepwater Tanner crab fisheries in the Aleutian Islands. Some directed fishing has targeted the species, however exploratory fishing does not indicate that a large biomass is present. Since 1992, annual harvest of scarlet king crabs in the Aleutian Islands has ranged from less than 5,000 pounds to nearly 63,000 pounds. Effort peaked in 1996 when 23 vessels made at least one landing and exvessel value was at a maximum in 1995 when the fishery was worth approximately \$110,000 (Table 4-8). Since 1996, effort and harvest in this fishery has been

minimal. When the BOF combined the Adak and Dutch Harbor king crab registration areas to create Area O, the Aleutian Islands, management of scarlet king crabs was not impacted (ADF&G 1999).

1999 Fishery

In 1999 only two vessels registered to fish for scarlet king crabs in the Aleutian Islands and only one made any landings, thus all harvest information is confidential.

Fishery Management and Stock Status

There are no surveys conducted, nor are any estimates of population abundance made for scarlet king crabs in the Aleutian Islands, consequently stock status and distribution are not well known. After the expiration of currently issued permits, the ADF&G will evaluate the fishery prior to issuance of permits allowing retention of scarlet king crab bycatch during the 2000/01 Aleutian Islands golden king crab fishery. No directed fishing for scarlet king crabs is anticipated prior to adoption of the Plan for the Development of New Fisheries in Alaska by the BOF. Future fisheries for scarlet king crabs would be conducted in accordance with the provisions of that plan. Observer coverage on each vessel registered for the king crab fisheries of the Aleutian Islands has provided biological information that will be used by the ADF&G to develop future management measures for scarlet king crab.

Literature Cited

Alaska Department of Fish and Game (ADF&G). 1999. Annual management report for the shellfish fisheries of the Westward Region, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K99-49, Kodiak.

EASTERN ALEUTIAN TANNER CRAB MANAGEMENT DISTRICT

Description of Area

The Eastern Aleutian Tanner crab management district encompasses all waters of Registration Area J between the longitude of Scotch Cap light at 164° 44' W long., west to 172° W long., and south of the latitude of Cape Sarichef at 54° 36' N lat. (Figure 4-7).

TANNER CRAB

Historic Background

The Eastern Aleutian District has not supported harvests of Tanner crabs, *Chionoecetes bairdi* as large as those recorded in other districts of Area J. Tanner crabs are found only in a few major bays and inlets of the Eastern Aleutians and the directed fishery for them was relatively small in volume and geographically limited until the late 1970s. The fishery began in Akutan and Unalaska Bays and subsequently expanded to include all areas of known Tanner crab distribution in the Eastern Aleutian District. Harvest of Tanner crabs over the last 26 years has typically remained under one million pounds per year. Only in the three consecutive seasons, 1976/1977 through 1978/1979 did the harvest exceed one million pounds, reaching a peak of 2.5 million pounds in the 1977/1978 season. Vessel participation was low in 1973 with only six vessels registered, and reached a high of 31 in 1982 when the fishery was in decline. Vessel participation declined in 1991 to five vessels and consequently the harvest reached a low of 50,038 pounds (Table 4-9). The eastern Aleutian Islands Tanner crab fishery reached a maximum exvessel value of approximately \$950,000 in 1977 and 1989 (Table 4-10). Commercial fishing for Tanner crabs has not been permitted in the Eastern Aleutian District since 1994 due to low stock abundance.

1999 Fishery Commercial Fishery

The Tanner crab fishery in the Eastern Aleutian District was not opened during the 1999 season due to low stock abundance.

1999 Subsistence Fishery

Subsistence harvest limit reductions applied to the Eastern Aleutian Islands red king crab fishery were not applied to Tanner crabs, however the permit and reporting requirements were reinstated. Between 1988 and 1994, an average of 15 subsistence permits per year were returned and these permits accounted for approximately 121 Tanner crabs. A survey of 15.1% of Unalaska households in 1994 generated an estimated subsistence Tanner crab harvest of 10,957 crabs (ADF&G 1999a). ADF&G staff in Dutch Harbor issued 180 subsistence permits in 1999 of which 71 were returned. Returned permits accounted for a Tanner crab harvest of 1,182 crabs and the estimated total harvest was 2,730 crabs (Table 4-3). The majority of Tanner crab harvest occurred in Illiuliuk and Captains Bays. Tanner crab harvest peaked in early July and continued until the permits expired on January 31.

Fishery Management and Stock Status

Prior to 1990, pot surveys were utilized to generate a Tanner crab abundance index in the eastern Aleutian Islands. The pot surveys were not utilized to generate a GHL; rather they were used monitor trends in abundance and recruitment. Since 1990, trawl surveys have been used to estimate abundance and they are used in conjunction with fishery data for management. Trawl

surveys in 1990 and 1991 indicated that a surplus of 100,000 pounds of Tanner crabs was available for harvest. A 1994 trawl survey of the same location revealed an 87% decrease in abundance of Tanner crabs since 1991. Results of the 1994 survey prompted the ADF&G to issue an emergency order that prevented opening of the 1995 season (ADF&G 1999b). A trawl survey conducted by the ADF&G in 1995 indicated that abundance of Tanner crabs had increased slightly over the 1994 level, but was still well below levels observed on the 1990 and 1991 surveys. The 1995 survey found an increase in juvenile male and immature female crabs, however the abundance of legal male crabs was still very low, thus the fishery closure was extended (Urban 1996). A trawl survey conducted in 1999 indicated that the biomass of Tanner crabs in the eastern Aleutian Islands has increased. Abundance increases were recorded for all size classes, with females and large males showing the greatest change. The majority of the recruitment was observed in Akutan and Unalaska Bays and Beaver Inlet. Despite this improvement, total biomass remains below levels observed in the early 1990s (Worton, *In press*).

The next survey of the eastern Aleutian Islands will occur during the summer of 2000. Prior to a reopening of the commercial fishery, the ADF&G will develop a management plan and harvest strategy through the Crab Plan Team and BOF process.

Literature Cited

- Alaska Department of Fish and Game (ADF&G). 1999a. Customary and traditional use worksheet for marine invertebrates, including king and tanner crab: Alaska Peninsula-Aleutian Islands Area *in* Westward Region Report to the Alaska Board of Fisheries 1999, Kodiak.
- Alaska Department of Fish and Game (ADF&G). 1999b. Annual management report for the shellfish fisheries of the Westward Region, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K99-49, Kodiak.
- Urban, Daniel. 1996. Bottom trawl survey of crab and groundfish: Kodiak Island Chignik, and Eastern Aleutian areas, 1995. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Informational Report 4K96-39, Kodiak.
- Worton, Carrie. *In press*. Bottom trawl survey of crab and groundfish: Kodiak Island, Chignik, South Alaska Peninsula, and Eastern Aleutian areas, 1999. Alaska Department of Fish and Game, Commercial Fisheries Division. Regional Informational Report 4K00-XX.

GROOVED TANNER CRAB

Historic Background

In a manner similar to other deep water crab fisheries in the Aleutian Islands, the first harvest of *Chionoecetes tanneri* or grooved Tanner crabs in the Eastern Aleutian District occurred in the early 1980s as incidental bycatch in the Dutch Harbor golden king crab fishery. Directed fishing for this species did not begin until 1993 however, when one vessel participated in a fishery that lasted from July until December. The grooved Tanner crab fishery in the Eastern Aleutian District typically occurred between March and December. Peak harvest in the Eastern Aleutian District occurred in 1995 when seven vessels landed approximately 850,000 pounds (Table 4-11).

Limited data has been collected regarding the abundance, distribution and stock status of deep water species in the Bering Sea and Aleutian Islands. During 1993 season, the ADF&G utilized data collected by onboard observers to restrict harvest to males of five inches or greater carapace width. In 1994, pursuant to permit provisions described in **5 AAC 35.082** (now **5 AAC 35.511. PERMITS FOR TANNERI AND ANGULATUS TANNER CRAB IN REGISTRATION AREA J**), the ADF&G required that vessels registered for this fishery carry an observer for all of their fishing activities. Data collected by observers has documented fishing practices, bycatch and has aided the ADF&G in developing further management measures.

In 1997, the ADF&G established GHLs for grooved tanner crabs in the Eastern Aleutian, Bering Sea and Alaska Peninsula districts where most historical harvest had occurred. Harvest levels in this fishery were derived using catch information from previous seasons and data collected by on-board observers. A GHL of 200,000 pounds was established for each of the aforementioned areas, while smaller harvest levels of 100,000 pounds were established for the Kodiak and Western Aleutian areas to allow for exploratory fishing. In addition, the ADF&G required that all pots be equipped with at least two escape rings of 4.5 inches minimum diameter (ADF&G 1999).

1999 Fishery

There were no vessels registered to harvest grooved Tanner crabs in the Eastern Aleutian District during 1999, consequently there was no directed harvest, nor was any harvest reported as bycatch in other deepwater crab fisheries.

Fishery Management and Stock Status

The grooved Tanner crab population in the Eastern Aleutian District is currently not surveyed; subsequently no estimates of population abundance are available for this stock. Fishery data from the mid 1990s is the primary source of information regarding abundance and stock status. Catch per unit of effort declined from 15 legal crabs per pot lift in 1993 to two in 1996 and catches decreased from over 850,000 in 1995 to 106,000 in 1996. In addition, fishing effort was concentrated in three statistical areas immediately to the south of Unalaska Island. This information indicates that at least in the area historically fished, the population was heavily exploited. Additional fishing will only be permitted at a reduced harvest level and fishery performance will be monitored in-season. Biological and fisheries data collected by observers stationed onboard all vessels registered for this fishery will provide information used by the ADF&G to establish a harvest strategy for this deepwater crab species.

Literature Cited

Alaska Department of Fish and Game (ADF&G) . 1999. Annual management report for the shellfish fisheries of the Westward Region, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K99-49, Kodiak.

TRIANGLE TANNER CRAB

Historic Background

In the Eastern Aleutian District *Chionoecetes angulatus* or triangle crab are harvested under a permit authorized in 5 AAC 35.511. **PERMITS FOR TANNERI AND ANGULATUS TANNER CRAB IN REGISTRATION AREA J.** Triangle crabs were harvested as incidental bycatch in the Eastern Aleutian grooved Tanner crab fishery, where the species has occurred in small numbers. Prior to 1995 and the beginning of the directed fishery, no harvest of Triangle crabs was reported on fish tickets, however shellfish observers stationed onboard vessels participating in the grooved Tanner crab fishery observed small numbers of triangle crabs harvested in 1994 (ADF&G 1999). Two vessels targeted triangle Tanner crabs in the Eastern Aleutian District during the 1995 and 1996 seasons, thus harvest information from those fisheries is confidential (Table 4-12).

1999 Fishery

No vessels were registered to harvest triangle crabs in the Eastern Aleutian District during 1999.

Fishery Management and Stock Status

Surveys of population abundance are not conducted for triangle crabs; thus the status of this stock is unknown. Due to the paucity of population level data for this species and the nature of the historical fishery, additional fishing for triangle Tanner crabs in the Eastern Aleutian District will be limited to bycatch during the Triangle Tanner crab fishery. All vessels registered for this fishery are required to carry an observer onboard during all fishing activities and biological data collected by these observers will be used to formulate a management plan for this deepwater species.

Literature Cited

Alaska Department of Fish and Game (ADF&G) . 1999. Annual management report for the shellfish fisheries of the Westward Region, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K99-49, Kodiak.

WESTERN ALEUTIAN TANNER CRAB MANAGEMENT DISTRICT

Description of Area

The Western Aleutian District of Statistical Area J includes all waters west of 172° W long., east of the U. S.-Russia Convention Line of 1867, and south of 54° 36' N lat. (Figure 4-7).

TANNER CRAB

Historic Background

Harvest of Tanner crabs, *Chionocetes bairdi*, from the Western Aleutian District has, in general, been incidental to the directed red king crab fishery in that area. Commercial harvest has ranged from a high of over 800,000 pounds during the 1981/82 season to less than 8,000 pounds in 1991/92. No commercial harvest of Tanner crabs has occurred in the Western Aleutian District since 1992/93 (Table 4-13). The western Aleutian district Tanner crab fishery reached a maximum value of just over \$1 million in 1981 (Table 4-14). Tanner crab abundance in the Western Aleutian District is probably limited by available habitat. Most of the historical harvest occurred within a few bays in the vicinity of Adak and Atka Islands.

1999/2000 Fishery

The Western Aleutian District Tanner crab fishery has a regulatory opening date of November 1, however, the ADF&G issued a news release keeping the fishery closed during the 1999/2000 season. The fishery was not opened because there is no BOF approved management plan in place, nor has sufficient population data been collected to develop a guideline harvest level.

Fishery Management and Stock Status

No stock assessment surveys are conducted for Tanner crabs in the Western Aleutian District, thus no population estimates are available. Stock status is currently unknown. Future surveys directed at red king crab in the Western Aleutian Islands may incorporate stations targeting Tanner crab as well. Biological data collected by observers stationed onboard all vessels registered for this fishery will be used to develop a management plan for this deepwater species.

GROOVED TANNER CRAB

Historic Background

In the Western Aleutian District, harvest of *Chionoecetes tanneri*, or grooved Tanner crab first occurred in conjunction with the developing golden king crab fishery in the Adak King Crab Management area during the late 1970s. Effort in this fishery has been minimal with two or fewer vessels participating during most years. Only in 1995 did significant fishing effort occur, when six vessels harvested approximately 145,000 pounds of grooved Tanner crabs (Table 4-15).

To prevent overharvest of this population where little abundance information is available, the ADF&G restricted harvest to males of five inches or greater carapace width in 1993. In addition, beginning in 1994, and pursuant to permit provisions provided in **5 AAC 35.511 PERMITS FOR TANNERI AND ANGULATUS TANNER CRAB IN REGISTRATION AREA J**, all vessels registered for the fishery were required to carry an onboard observer for all of their

fishing activities. Using information collected by onboard observers and historic catch information, the ADF&G established GHLs for grooved Tanner crabs in the Western Aleutian District. The GHL was set at 100,000 pounds; this level was believed to be adequate to allow for exploratory fishing and incidental bycatch harvest (ADF&G 1999).

In addition to harvest of Tanner and grooved Tanner crab, fishers have anecdotally reported triangle Tanner crab harvest as incidental bycatch in the grooved Tanner crab and golden king crab fisheries in the Western Aleutian District. There has been no documented harvest of triangle Tanner crab from this area.

1999 Fishery

There were no vessels registered to fish for grooved Tanner crabs in the Western Aleutian District in 1999. Consequently, there was no directed harvest, nor was any harvest reported as bycatch in other deepwater crab fisheries.

Fishery Management and Stock Status

No stock assessment surveys have been conducted for grooved Tanner crabs in the Western Aleutian District; therefore, no estimates of population abundance are available. Fishery data from the mid 1990s indicates that the Western Aleutian Islands may not support grooved Tanner crab populations as large as the Eastern Aleutian Islands and the Bering Sea. Neither catch nor catch per unit of effort were large when compared to those observed in other districts. Grooved Tanner crab habitat appears to be ample and further exploratory fishing, if any may located new stocks. Biological data collected by onboard observers in this fishery will be used by the ADF&G to formulate a harvest strategy for this deepwater Tanner crab species.

Literature Cited

Alaska Department of Fish and Game (ADF&G) . 1999. Annual management report for the shellfish fisheries of the Westward Region, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K99-49, Kodiak.

ALEUTIAN DISTRICT DUNGENESS CRAB

Description of Area

The Aleutian District Dungeness crab management area includes all waters of Registration Area J west of the longitude of Scotch Cap Light (164°44' W long.) and south of the latitude of Cape Sarichef (54°36' N lat.) (Figure 4-8).

Historic Background

Islands in the Aleutian Chain are separated by deep passes with swift current and they are closely bordered on the north and south by the Aleutian Basin and Trench, respectively. Dungeness crabs inhabit bays, estuaries, and other shallow water habitats. Suitable habitat for Dungeness crabs in the Aleutian Islands is sparse and widely dispersed; therefore, populations are small and fishing effort has been low within the district.

The Aleutian District Dungeness crab fishery has occurred primarily as a small vessel, summer fishery in the vicinity of Unalaska Island, mainly within Unalaska Bay. Some larger vessel effort has occurred in other locales within the District. Effort in these areas has been sporadic throughout the history of the fishery. Interest and activity in this fishery has been erratic from year to year, with the first reliable reports of harvest made in 1970. Since 1974, deliveries have ranged from zero in 1976, 1977, 1980, 1981, and 1994 through 1996, to over 91,000 pounds in 1984/85 (Table 4-16). In addition to commercial harvest, Dungeness crabs have also been taken in subsistence and sport fisheries occurring in the vicinity of Unalaska Island. Subsistence harvest reports issued by the ADF&G between 1988 and 1994 indicate that Dungeness harvests were larger than those documented for both king and Tanner crabs. On average 15 harvest reports were returned per year and Dungeness harvest averaged 686 crabs with a range of five to 1,906 crabs (ADF&G 1999). No estimate of Dungeness harvest by sport or subsistence users is currently available, but it is believed to be small.

1998/99 Fishery

The 1998/99 Aleutian District Dungeness crab fishery opened by regulation at 12:00 noon on May 1, however no vessels registered for the fishery which closed by regulation at 12:00 noon, January 1, 1999.

Fishery Management and Stock Status

The Aleutian Islands Dungeness crab fishery has been managed using size, sex and season restrictions. No stock assessment work has been performed and limited biological and fishery data has been collected through dockside sampling. The status of this species in the Aleutian Islands is unknown, but the resource is believed to be limited due to the lack of suitable habitat. The ADF&G does not intend to register any vessels for this fishery prior to the development of a BOF approved management plan.

Literature Cited

Alaska Department of Fish and Game (ADF&G). 1999. Customary and traditional use worksheet for marine invertebrates, including king and tanner crab: Alaska Peninsula-Aleutian Islands Area in Westward Region Report to the Alaska Board of Fisheries 1999, Kodiak.

ALEUTIAN DISTRICT SHRIMP

Description of Area

The Aleutian shrimp district of Area J includes all Bering Sea and Pacific Ocean waters west of the longitude of Cape Sarichef at 164° 55' W long. (Figure 4-9). The Aleutian District includes four sections: Unalaska Bay, Makushin Bay, Usuf Bay and Beaver Inlet.

Historic Background

Commercial fishing for shrimp in the Aleutian District began in the 1960s with Russian and Japanese participation. Most harvest occurred northwest of the Pribilof Islands and harvests were as large as 30,000 mt per year. In 1972 a domestic trawl fishery began targeting pink shrimp *Pandalus borealis* in the vicinity of Unalaska Island. Catch and effort increased and harvest peaked in 1977/78 at 6.8 million pounds. Sharp declines in catches after 1978 brought on a reduction in season length. Between 1983 and 1992 no fishing occurred, however in 1992 four catcher-processors targeted shrimp northwest of the Pribilof Islands. Low concentrations of shrimp were located and all four vessels departed the fishery after making a total of six landings for 72,133 pounds (Table 4-17). Since 1992, interest in fishing for shrimp in the Aleutian District has persisted at a very low level. Prior to 1999, several vessels registered to fish, however no landings were made.

1999 Fishery

The first commercial harvest of shrimp in the Aleutian District since 1992 occurred in 1999. Only two vessels registered for the fishery, therefore catch information is confidential. Initial catches were composed primarily of pink shrimp, however as the fishery progressed, sidestripe shrimp *Pandalopsis dispar* became the dominant species in the catch. The fishery was closed on July 9 because the ADF&G did not possess adequate information regarding the abundance and distribution of these species and it was not possible to prosecute the fishery in accordance with 5 AAC 39.210. **MANAGEMENT PLAN FOR HIGH IMPACT EMERGING FISHERIES.**

Fishery Management and Stock Status

The ADF&G has obtained little population information for the shrimp stocks of the Bering Sea and Aleutian Islands. The last extensive commercial activity occurred in the 1970's and stock assessment surveys conducted by the ADF&G and NMFS do not target shrimp or cover much of the important shrimp habitat. As a result, the ADF&G does not possess adequate information to develop a management plan or conduct a commercial fishery. Fishers have expressed interest in collaborating with the ADF&G on a stock assessment survey, but funding constraints have limited such endeavors. Once the BOF has adopted the Plan for the Development of New Fisheries in Alaska, a collaborative survey trip may be one step in the creation of a sustainable, well managed fishery. In addition, trawl surveys of the continental slope, which will be

performed by NMFS during the summer of 2000, may provide additional insight into shrimp distribution and habitat usage.

ALEUTIAN DISTRICT MISCELLANEOUS SHELLFISH SPECIES

Description of the Area

The Aleutian District of Registration Area J includes all waters south of the latitude of Cape Sarichef (54° 36' N lat.), west of the longitude of Scotch Cap Light (164° 44' W long.), and east of the U.S.-Russia Convention line of 1867 (Figure 4-10).

Introduction

Shellfish species included in this section are those which have been harvested in relatively small amounts compared to the commercial king and Tanner crab fisheries which occur in the Aleutian Islands. Miscellaneous shellfish species include hair crabs, sea urchins, sea cucumbers, snails and *Paralomis multispina*. Prior to 1999, it was the policy of the ADF&G to register vessels for exploratory fishing in these new and emerging fisheries under authority of a commissioner's permit described in **5 AAC 38.062. PERMITS FOR OCTOPI, SQUID, KOREAN HAIR CRAB, SEA URCHINS, SEA CUCUMBERS, SEA SNAILS, CORAL, AND OTHER MARINE INVERTEBRATES**. Typically, permit conditions were general and not fully developed on an individual species basis. Fisheries for miscellaneous shellfish species occurred without prior knowledge of stock abundance or distribution and no harvest limits were established. To allow for the orderly development and regulation of expanding fisheries, the BOF adopted **5 AAC 39.210. MANAGEMENT PLAN FOR HIGH IMPACT EMERGING FISHERIES**. Which delineates criteria that must be met in order for a new fishery to occur. In addition, the BOF will be considering a Plan for the Development of New Fisheries that will provide a framework to be employed by resource harvesters in the development of new fisheries. Prior to the adoption of this plan, the ADF&G will only register vessels for those fisheries that are considered developed.

1999 Fisheries

No vessels were registered for any miscellaneous shellfish species in 1999 with the exception of octopus bycatch. (Table 4-18). Fifty-eight vessels made 338 landings of octopus totaling 133,850 pounds from the Aleutian Islands. Vessels targeting Pacific cod or crab using pot gear made the majority of these landings. Octopus bycatch is typically retained and utilized for bait, or sold to processors where it is resold as bait.

Fishery Management and Stock Status

No surveys of abundance targeting octopus have been performed in the Aleutian Islands; thus no population data is available. In addition, the ADF&G has not developed a management plan for

this species. Future harvests, if any, will be conducted as bycatch limited to 20% of the weight of the target species. Stock assessment work has not been performed for other miscellaneous shellfish species in the Aleutian Islands and until such work has been performed and a BOF approved management plan has been adopted, no fisheries will occur.

Table 4-1. Aleutian Islands, Area O, red king crab commercial fishery data, 1960/61-1998/99.

Season	Locale	Number of			Harvest ^{b,c}	Pots		Average		Deadloss ^c
		Vessels ^a	Landings	Crabs ^b		Lifted	CPUE ^d	Weight ^c	Length ^e	
1960/61	East of 172°	NA	NA	NA	NA	NA	NA	NA	NA	NA
	West of 172°	4	41	NA	2,074,000	NA	NA	NA	NA	NA
	TOTAL									
1961/62	East of 172°	4	69	NA	533,000	NA	NA	NA	NA	NA
	West of 172°	8	218	NA	6,114,000	NA	NA	NA	NA	NA
	TOTAL		287		6,647,000					
1962/63	East of 172°	6	102	NA	1,536,000	NA	NA	NA	NA	NA
	West of 172°	9	248	NA	8,006,000	NA	NA	NA	NA	NA
	TOTAL		350		9,542,000					
1963/64	East of 172°	4	242	NA	3,893,000	NA	NA	NA	NA	NA
	West of 172°	11	527	NA	17,904,000	NA	NA	NA	NA	NA
	TOTAL		769		21,797,000					
1964/65	East of 172°	12	336	NA	13,761,000	NA	NA	NA	NA	NA
	West of 172°	18	442	NA	21,193,000	NA	NA	NA	NA	NA
	TOTAL		778		34,954,000					
1965/66	East of 172°	21	555	NA	19,196,000	NA	NA	NA	NA	NA
	West of 172°	10	431	NA	12,915,000	NA	NA	NA	NA	NA
	TOTAL		986		32,111,000					
1966/67	East of 172°	27	893	NA	32,852,000	NA	NA	NA	NA	NA
	West of 172°	10	90	NA	5,883,000	NA	NA	NA	NA	NA
	TOTAL		983		38,735,000					
1967/68	East of 172°	34	747	NA	22,709,000	NA	NA	NA	NA	NA
	West of 172°	22	505	NA	14,131,000	NA	NA	NA	NA	NA
	TOTAL		1,252		36,840,000					

-Continued-

Table 4-1. (Page 2 of 5)

Season	Locale	Number of			Harvest ^{b,c}	Pots		Average		Deadloss ^c
		Vessels ^a	Landings	Crabs ^b		Lifted	CPUE ^d	Weight ^c	Length ^e	
1968/69	East of 172°	NA	NA	NA	11,300,000	NA	NA	NA	NA	NA
	West of 172°	30	NA	NA	16,100,000	NA	NA	NA	NA	NA
	TOTAL				27,400,000					
1969/70	East of 172°	41	375	NA	8,950,000	72,683	NA	NA	NA	NA
	West of 172°	33	435	NA	18,016,000	115,929	NA	6.5	NA	NA
	TOTAL		810		26,966,000	188,612				
19670/71	East of 172°	32	268	NA	9,652,000	56,198	NA	NA	NA	NA
	West of 172°	35	378	NA	16,057,000	124,235	NA	NA	NA	NA
	TOTAL		646		25,709,000	180,433				
1971/72	East of 172°	32	210	1,447,692	9,391,615	31,531	46	7	NA	NA
	West of 172°	40	166	NA	15,475,940	46,011	NA	NA	NA	NA
	TOTAL		376		24,867,555	77,542				
1972/73	East of 172°	51	291	1,500,904	10,450,380	34,037	44	7		
	West of 172°	43	313	3,461,025	18,724,140	81,133	43	5.4	NA	NA
	TOTAL		604	4,961,929	29,174,520	115,170	43	5.9		
1973/74	East of 172°	56	290	1,780,673	12,722,660	41,840	43	7.1	NA	NA
	West of 172°	41	239	1,844,974	9,741,464	70,059	26	5.3	148.6	NA
	TOTAL		529	3,625,647	22,464,124	111,899	32	6.2		
1974/75	East of 172°	87	372	1,812,647	13,991,190	71,821	25	7.7		
	West of 172°	36	97	532,298	2,774,963	32,620	16	5.2	148.6	NA
	TOTAL		469	2,344,945	16,766,153	104,441	22	7.1		
1975/76	East of 172°	79	369	2,147,350	15,906,660	86,874	25	7.4		
	West of 172°	20	25	79,977	411,583	8,331	10	5.2	147.2	NA
	TOTAL		394	2,227,327	16,318,243	95,205	23	7.3		

-Continued-

Table 4-1. (Page 3 of 5)

Season	Locale	Number of			Harvest ^{b,c}	Pots Lifted	CPUE ^d	Average		Deadloss ^c
		Vessels ^a	Landings	Crabs ^b				Weight ^c	Length ^e	
1976/77	East of 172°	72	226	1,273,298	9,367,965	65,796	19	7.4		
	East of 172°	38	61	86,619	830,458	17,298	5	9.6	NA	NA
	West of 172°				FISHERY CLOSED					
	TOTAL		287	1,359,917	10,198,423	83,094	16	7.5		
1977/78	East of 172°	33	227	539,656	3,658,860	46,617	12	6.8		
	East of 172°	6	7	3,096	25,557	812	4	8.3	NA	NA
	West of 172°	12	18	160,343	905,527	7,269	22	5.7	152.2	NA
	TOTAL		252	703,095	4,589,944	54,698	13	6.5		
1978/79	East of 172°	60	300	1,233,758	6,824,793	51,783	24	5.5	NA	NA
	West of 172°	13	27	149,491	807,195	13,948	11	5.4	NA	1,170
	TOTAL		327	1,383,249	7,631,988	65,731	21	5.5		
1979/80	East of 172°	104	542	2,551,116	15,010,840	120,554	21	5.9	NA	NA
	West of 172°	18	23	82,250	467,229	9,757	8	5.7	152	24,850
	TOTAL		565	2,633,366	15,478,069	130,311	20	5.9		
1980/81	East of 172°	114	830	2,772,287	17,660,620	231,607	12	6.4	NA	NA
	East of 172°	54	120	182,349	1,392,923	30,000	6	7.6		
	West of 172°	17	52	254,390	1,419,513	20,914	12	5.6	149	54,360
	TOTAL		1,002	3,209,026	20,473,056	282,521	11	6.4		
1981/82	East of 172°	92	683	741,966	5,155,345	220,087	3	6.9	NA	NA
	West of 172°	46	106	291,311	1,648,926	40,697	7	5.7	148.3	8,759
	TOTAL		789	1,033,277	6,804,271	260,784	4	6.6		
1982/83	East of 172°	81	278	64,380	431,179	72,924	1	6.7		
	West of 172°	72	191	284,787	1,701,818	66,893	4	6.0	150.8	7,855
	TOTAL		469	349,167	2,132,997	139,817	3	6.1		

-Continued-

Table 4-1. (Page 4 of 5)

Season	Locale	Number of			Harvest ^{b,c}	Pots Lifted	CPUE ^d	Average		Deadloss ^c
		Vessels ^a	Landings	Crabs ^b				Weight ^c	Length ^e	
1983/84	East of 172°				FISHERY CLOSED					
	West of 172°	106	248	298,948	1,981,579	60,840	5	6.6	157.3	3,833
	TOTAL	106	248	298,948	1,981,579	60,840	5	6.6	157.3	3,833
1984/85	East of 171°				FISHERY CLOSED					
	West of 171°	64	113	206,751	1,367,672	50,685	4	6.6	155.1	0
	TOTAL	64	113	206,751	1,367,672	50,685	4	6.6	155.1	0
1985/86	East of 171°				FISHERY CLOSED					
	West of 171°	35	89	162,271	906,293	32,478	5	5.6	152.2	6,120
	TOTAL	35	89	162,271	906,293	32,478	5	5.6	152.2	6,120
1986/87	East of 171°				FISHERY CLOSED					
	West of 171°	33	69	126,146	712,243	29,189	4	5.6	NA	500
	TOTAL	33	69	126,146	712,243	29,189	4	5.6	NA	501
1987/88	East of 171°				FISHERY CLOSED					
	West of 171°	71	109	211,712	1,213,933	43,433	5	5.7	148.5	6,900
	TOTAL	71	109	211,712	1,213,933	43,433	5	5.7	148.5	6,900
1988/89	East of 171°				FISHERY CLOSED					
	West of 171°	73	156	266,053	1,567,314	64,374	4	5.9	153.1	557
	TOTAL	73	156	266,053	1,567,314	64,374	4	5.9	153.1	557
1989/90	East of 171°				FISHERY CLOSED					
	West of 171°	56	123	196,070	1,118,566	54,513	4	5.7	151.5	759
	TOTAL	56	123	196,070	1,118,566	54,513	4	5.7	151.5	759
1990/91	East of 171°				FISHERY CLOSED					
	West of 171°	7	34	146,903	828,105	10,674	14	5.6	148.1	0
	TOTAL	7	34	146,903	828,105	10,674	14	5.6	148.1	0

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Table 4-1. (Page 5 of 5)

Season	Locale	Number of			Harvest ^{b,c}	Pots		Average		Deadloss ^c
		Vessels ^a	Landings	Crabs ^b		Lifted	CPUE ^d	Weight ^c	Length ^e	
1991/92	East of 171°				FISHERY CLOSED					
	West of 171°	10	35	165,356	951,278	16,636	10	5.7	149.8	0
	TOTAL	10	35	165,356	951,278	16,636	10	5.7	149.8	0
1992/93	East of 171°				FISHERY CLOSED					
	West of 171°	12	30	218,049	1,286,424	16,129	13	6.0	151.5	5,000
	TOTAL	12	30	218,049	1,286,424	16,129	13	6.0	151.5	5,000
1993/94	East of 171°				FISHERY CLOSED					
	West of 171°	12	21	119,330	698,077	13,575	9	5.8	154.6	7,402
	TOTAL	12	21	119,330	698,077	13,575	9	5.8	154.6	7,402
1994/95	East of 171°				FISHERY CLOSED					
	West of 171°	20	31	30,337	196,967	18,146	2	6.5	157.5	1,430
	TOTAL	20	31	30,337	196,967	18,146	2	6.5	157.5	1,430
1995/96	East of 171°				FISHERY CLOSED					
	West of 171°	4	12	6,880	38,941	2,205	3	5.7	153.6	235
	TOTAL	4	12	6,880	38,941	2,205	3	5.7	153.6	235
1996/97					FISHERY CLOSED					
1997/98					FISHERY CLOSED					
1998/99		2			CONFIDENTIAL					

^aMany vessels fished both east and west of 171W, thus total number of vessels reflects registrations for entire Aleutian Islands.

^bDeadloss included.

^cIn Pounds.

^dNumber of legal crabs per pot lift.

^eIn millimeters.

Table 4-2. Aleutian Islands, Area O, red king crab fishery economic performance data 1960/61-1999.

Season		Exvessel Price Per Pound	Season Total
1960 TO 1972 NO ECONOMIC DATA AVAILABLE			
1973/74	East of 172°	\$0.65	\$8,269,729
	West of 172°	NA	NA
	TOTAL		
1974/75	East of 172°	\$0.37	\$5,176,740
	West of 172°	NA	NA
	TOTAL		
1975/76	East of 172°	\$0.42	\$6,680,797
	West of 172°	NA	NA
	TOTAL		
1976/77	East of 172°	\$0.64	\$5,995,497
	East of 172°	\$0.79	\$656,061
	West of 172°		
	TOTAL		
1977/78	East of 172°	\$0.99	\$3,622,271
	East of 172°	\$1.35	\$34,502
	West of 172°	NA	NA
	TOTAL		
1978/79	East of 172°	\$1.35	\$9,213,471
	West of 172°	NA	NA
	TOTAL		
1979/80	East of 172°	\$0.90	\$13,509,756
	West of 172°	NA	NA
	TOTAL		
1980/81	East of 172°	\$1.02	\$18,013,832
	East of 172°	\$1.03	\$1,434,711
	West of 172°	NA	NA
	TOTAL		
1981/82	East of 172°	\$2.30	\$11,617,293
	West of 172°	NA	NA
	TOTAL		
1982/83	East of 172°	\$3.43	\$1,478,944
	West of 172°	NA	NA
	TOTAL		
1984 TO 1997 NO ECONOMIC DATA AVAILABLE			
1998/99	West of 174°	CONFIDENTIAL	

Table 4-3. Eastern Aleutian Islands subsistence king and Tanner crab harvest, 1999.

Number of Permits Issued	Number of Permits Returned	Percentage Returned	Harvest			
			King crab reported	King crab estimated	Tanner crab reported	Tanner crab estimated
180	71	39.4	707	1,455	1,182	2,730

Table 4-4. Aleutian Islands golden king crab commercial fishery data, 1981/82-1998/99 seasons.

Season	Locale	Number of			Harvest ^{b,c}	Number of Pots		CPUE ^d	Average		
		Vessels ^a	Landings	Crabs ^b		Registered	Lifted		Weight ^c	Length ^e	Deadloss ^c
1981/82	East of 172° W.	6	16	22,666	115,715	0	2,906	8	5.1	158.1	8,752
	West of 172° W.	14	76	217,700	1,194,046	2,647	24,627	9	5.5	159.6	22,064
	TOTAL		92	240,458	1,319,761	2,647	27,533	9	5.4		30,816
1982/83	East of 172° W.	49	136	227,471	1,184,971	NA	29,369	8	5.2	158.1	47,479
	West of 172° W.	99	501	1,509,001	8,006,274	13,111	150,103	10	5.3	158.2	220,743
	TOTAL		637	1,737,109	9,191,245	13,111	179,472	10	5.3		268,222
1983/84	East of 172° W.	47	132	238,353	1,810,973	4,514	29,595	8	7.6	NA	45,268
	West of 172° W.	157	1,002	1,534,909	8,128,029	17,406	226,798	7	5.3	NA	171,021
	TOTAL		1,134	1,773,262	9,939,002	21,920	256,393	7	5.6		186,289
1984/85	East of 171° W.	13	67	327,440	1,521,142	1,394	24,044	14	4.6	161.2	70,362
	West of 171° W.	38	85	643,597	3,180,095	5,270	64,777	10	4.9	156.7	125,073
	TOTAL		152	971,274	4,701,237	6,664	88,821	11	4.8		195,435
1985/86	East of 171° W.	13	67	410,977	1,968,213	1,479	34,287	12	4.7	155.7	38,663
	West of 171° W.	49	386	2,052,048	11,124,759	7,057	202,401	10	5.4	151.3	5,304
	TOTAL		453	2,463,025	13,092,972	8,536	236,688	10	5.3		43,967
1986/87	East of 171° W.	17	71	400,389	1,869,180	1,575	37,585	11	4.7	NA	9,510
	West of 171° W.	62	525	2,923,947	12,798,004	12,958	392,185	7	4.4	149.5	276,736
	TOTAL		596	3,324,336	14,667,184	14,533	429,770	8	4.4		286,246
1987/88	East of 171° W.	22	77	299,734	1,383,198	3,591	43,017	7	4.6	149.6	24,210
	West of 171° W.	46	386	1,908,989	8,001,177	10,687	267,705	7	4.2	146.9	165,415
	TOTAL		463	2,208,723	9,324,375	14,278	310,722	7	4.2		189,625
1988/89	East of 171° W.	21	57	323,695	1,545,113	4,215	40,869	8	4.8	154.3	22,960
	West of 171° W.	74	455	2,165,508	9,080,196	23,627	280,732	8	4.2	149.1	122,251
	TOTAL		512	2,489,203	10,625,309	27,842	321,604	8	4.3		145,211

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Table 4-4. (Page 2 of 3)

Season	Locale	Number of		Crabs ^b	Harvest ^{b,c}	Number of Pots		CPUE ^d	Average		Deadloss ^c
		Vessels ^a	Landings			Registered	Lifted		Weight ^c	Carapace length ^e	
1989/90	East of 171° W.	13	70	424,067	1,852,249	5,635	43,345	10	4.4	150.9	17,421
	West of 171° W.	64	505	2,520,786	10,162,400	14,724	324,153	8	4.0	148.5	100,724
	TOTAL		575	2,944,853	12,014,649	20,359	367,498	8	4.1		118,145
1990/91	East of 171° W.	16	58	384,885	1,718,848	5,225	54,618	7	4.3	147.5	42,800
	West of 171° W.	13	167	1,312,116	5,250,687	7,380	160,960	8	4.0	144.5	176,583
	TOTAL	24	235	1,697,001	6,969,535	12,605	214,578	8	4.1		219,383
1991/92	East of 171° W.	11	50	335,647	1,447,732	3,760	40,604	8	4.3	147.9	45,100
	West of 171° W.	16	206	1,511,751	6,254,409	7,635	192,949	8	4.1	144.7	96,848
	TOTAL	20	256	1,847,398	7,702,141	11,395	233,553	8	4.2		141,948
1992/93	East of 171° W.	10	44	330,159	1,375,048	4,222	37,718	9	4.1	147.8	37,200
	West of 171° W.	18	130	1,198,169	4,916,149	8,236	165,503	7	4.1	147.0	104,215
	TOTAL	22	174	1,528,328	6,291,197	12,458	203,221	8	4.1		141,415
1993/94	East of 171° W.	4	14	217,788	915,460	2,334	22,490	10	4.2	149.1	7,324
	West of 171° W.	21	147	1,102,541	4,635,683	11,970	212,164	5	4.2	147.8	165,358
	TOTAL	21	161	1,320,329	5,551,143	14,304	234,654	6	4.2		172,682
1994/95	East of 171° W.	14	45	384,353	1,750,267	7,378	67,537	6	4.6	147.6	29,908
	West of 171° W.	34	247	1,539,866	6,378,030	15,604	319,006	5	4.1	149.5	242,065
	TOTAL	35	292	1,924,219	8,128,297	22,982	386,543	5	4.2		271,973
1995/96	East of 171° W.	17	42	431,867	1,993,980	10,325	65,030	7	4.6	149.6	14,676
	West of 171° W.	25	139	1,134,274	4,896,926	14,213	226,463	5	4.2	147.3	338,223
	TOTAL	28	181	1,566,141	6,890,906	24,538	291,493	5	4.4		352,899
1996/97	East of 174° W.	14	70	725,452	3,262,516	NA	113,460	6	4.5		156,857
	West of 174° W.	13	100	618,498	2,591,720	NA	100,340	6	4.2		78,973
	TOTAL	18	170	1,343,950	5,854,236	11,080	213,800	6	4.4	147.0	235,830

-Continued-

Table 4-4. (Page 3 of 3)

Season	Locale	Number of		Crabs ^b	Harvest ^{b,c}	Number of Pots		CPUE ^d	Average		Deadloss ^c
		Vessels ^a	Landings			Registered	Lifted		Weight ^c	Carapace length ^e	
1997/98	East of 174° W.	13	74	780,609	3,501,054	10,100	106,403	7	4.5		131,480
	West of 174° W.	8	160	569,550	2,444,628	4,690	86,811	7	4.3		79,525
	TOTAL	15	234	1,350,159	5,945,682	10,100	193,214	7	4.4	147.3	211,005
1998/99	East of 174° W.	14	55	740,011	3,247,863	8,365	83,378	9	4.4		82,113
	West of 174° W.	3	44	409,531	1,691,385	1,930	35,920	12	4.1		21,218
	TOTAL	16	99	1,149,542	4,939,248	10,295	119,298	10	4.3	146.8	103,331

^aMany vessels fished both east and west of 174W, thus total number of vessels reflects registrations for entire Aleutian Islands.

^bDeadloss included.

^cIn pounds.

^dNumber of legal crabs per pot lift.

^eIn millimeters.

Table 4-5. Aleutian Islands golden king crab fishery economic performance, 1981/82-1998/99 seasons.

Year		Value		Season Length	
		Exvessel ^a	Total ^b	Days	Dates
1981/82	East of 172° W.	\$2.05	\$0.22	75	11/01-01/15
	West of 172° W.	\$2.06	\$2.41	227	11/01-06/15
	Total	\$2.06	\$2.63		
1982/83	East of 172° W.	\$3.00	\$3.41	105	11/01-02/15
	West of 172° W.	\$3.01	\$23.43	166	11/01-04/15
	Total	\$3.01	\$26.85		
1983/84	East of 172° W.	\$3.05	\$5.38	105	11/01-02/15
	West of 172° W.	\$2.92	\$23.23	157	11/10-04/15
	Total	\$2.94	\$28.62		
1984/85	East of 171° W.	\$1.35	\$1.96	229	07/01-02/15
	West of 171° W.	\$2.00	\$6.11	240	11/10-07/08
	Total	\$1.79	\$8.07		
1985/86	East of 171° W.	\$2.00	\$3.86	121	07/01-10/31
	West of 171° W.	\$2.50	\$27.80	288	11/01-08/15
	Total	\$2.43	\$31.66		
1986/87	East of 171° W.	\$2.85	\$5.30	182	07/01-12/31
	West of 171° W.	\$3.00	\$37.56	288	11/01-08/15
	Total	\$2.98	\$42.86		
1987/88	East of 171° W.	\$2.85	\$3.87	62	07/01-09/02
	West of 171° W.	\$3.00	\$23.51	289	11/01-08/15
	Total	\$2.98	\$27.38		
1988/89	East of 171° W.	\$3.00	\$4.57	93	09/01-12/04
	West of 171° W.	\$3.20	\$28.66	288	11/01-08/15
	Total	\$3.17	\$33.23		
1989/90	East of 171° W.	\$3.50	\$6.42	104	09/01-12/15
	West of 171° W.	\$3.00	\$30.18	288	11/01-08/15
	Total	\$3.08	\$36.61		
1990/91	East of 171° W.	\$3.00	\$5.03	68	09/01-11/09
	West of 171° W.	\$3.00	\$15.22	288	11/01-08/15
	Total	\$3.00	\$20.25		
1991/92	East of 171° W.	\$2.00	\$2.81	74	09/01-11/15
	West of 171° W.	\$2.50	\$15.39	289	11/01-08/15
	Total	\$2.41	\$18.20		
1992/93	East of 171° W.	\$2.50	\$3.30	76	09/01-11/17
	West of 171° W.	\$2.05	\$9.86	288	11/01-08/15
	Total	\$2.15	\$13.16		
1993/94	East of 171° W.	\$2.15	\$1.95	212	09/01-03/31
	West of 171° W.	\$2.50	\$11.18	288	11/01-08/15
	Total	\$2.44	\$13.13		

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Table 4-5. (Page 2 of 2)

Year		Value		Season Length	
		Exvessel ^a	Total ^b	Days	Dates
1994/95	East of 171° W.	\$4.00	\$6.88	57	09/01-10/28
	West of 171° W.	\$3.33	\$20.43	288	11/01-08/15
	Total	\$3.48	\$27.31		
1995/96	East of 171° W.	\$2.60	\$5.15	38	09/01-10/09
	West of 171° W.	\$2.10	\$9.57	289	11/01-08/15
	Total	\$2.25	\$14.72		
1996/97	East of 174° W.	\$2.23	\$6.93	115	09/01-12/25
	West of 174° W.	\$2.23	\$5.60	365	09/01-08/31
	Total	\$2.23	\$12.53		
1997/98	East of 174° W.	\$2.25	\$7.58	84	09/01-11/24
	West of 174° W.	\$2.10	\$4.96	365	09/01-08/31
	Total	\$2.19	\$12.54		
1998/99	East of 174° W.	\$1.87	\$5.92	68	09/01-11/07
	West of 174° W.	\$2.04	\$3.41	365	09/01-08/31
	Total	\$1.92	\$9.33		

^aAverage price per pound.^bIn millions of pounds.

Table 4-6. Aleutian Islands golden king crab catch by statistical area, 1998/99 season.

Locale	Statistical area	Number of		Harvest ^{a,b}	Pots lifted	Average		
		Landings	Crab ^a			CPUE ^c	Weight ^b	Deadloss ^b
Islands of four mts.	685231	3	2,574	12,590	1,000	3	4.9	499
	685303	2	780	4,057	595	1	5.2	52
	685304	5	2,393	11,882	1,445	2	5.0	241
	685331	2	167	871	130	1	5.2	11
	695200	9	35,646	178,408	4,069	9	5.0	6,180
	695232	13	23,589	122,585	5,327	4	5.2	7,190
	695301	6	24,951	120,436	3,474	7	4.8	2,578
	695302	3	13,317	55,361	980	14	4.2	2,503
	705200	19	51,194	226,157	6,994	7	4.4	8,766
	705231	1	274	1,132	21	13	4.1	12
Yunaska	705232	22	165,909	716,789	17,106	10	4.3	22,551
	705233	2	2,368	9,740	382	6	4.1	135
	705234	1	423	1,793	30	14	4.2	17
	705300	10	23,578	100,466	2,478	10	4.3	2,867
	715130	4	3,952	16,124	291	14	4.1	591
Amukta Pass	715201	2	2,096	9,032	112	19	4.3	237
	715202	11	89,957	374,240	7,718	12	4.2	6,443
	715231	10	57,540	244,195	4,505	13	4.2	5,686
	715232	4	28,728	123,128	1,745	17	4.3	2,587
Seguam Pass	725201	16	113,338	501,057	10,834	11	4.4	6,331
	725203	8	44,875	183,493	7,051	6	4.1	2,036
	725230	8	13,526	56,118	1,095	12	4.2	606
Amlia	735201	4	19,988	94,154	3,868	5	4.7	2,389
	735230	7	18,021	80,266	1,977	9	4.5	1,527
	735300	1	827	3,789	151	6	4.6	78
	765135	1	740	3,345	33	22	4.5	64

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Table 4-6. (Page 2 of 3)

Locale	Statistical area	Number of		Harvest ^{a,b}	Pots lifted	Average		
		Landings	Crab ^a			CPUE ^c	Weight ^b	Deadloss ^b
Adak	765202	1	1,136	5,132	30	38	4.5	98
	765203	1	919	4,152	30	31	4.5	79
	775133	1	1,136	5,132	60	19	4.5	5
	785101	4	3,535	16,307	239	15	4.6	270
	785102	7	34,645	150,458	3,119	11	4.3	4,699
Delarof Islands	785103	6	1,721	7,292	169	10	4.2	307
	785131	7	35,907	160,504	2,586	14	4.5	4,625
	785132	7	8,466	38,473	635	13	4.5	898
	785134	6	5,491	24,790	544	10	4.5	665
	785135	5	3,012	12,683	334	9	4.2	446
	795101	6	4,732	19,641	484	10	4.2	762
	795102	6	14,457	63,337	1,526	9	4.4	2,339
	795131	6	4,275	19,493	348	12	4.6	471
	795132	7	16,822	71,965	1,439	12	4.3	2,632
	795200	24	23,449	93,713	1,767	13	4.0	79
Amchitka Pass	795230	8	11,197	46,068	1,056	11	4.1	27
	805103	14	17,223	67,984	1,469	12	3.9	88
	805131	9	5,274	21,084	294	18	4.0	32
	805132	28	75,841	297,690	5,091	15	3.9	219
	805201	23	45,502	177,900	3,006	15	3.9	124
Semisopochnoi Is.	805230	3	1,595	6,481	172	9	4.1	4
	815100	10	5,686	22,138	480	12	3.9	17
	815131	13	11,702	45,385	800	15	3.9	4
Oglala Pass	815132	5	2,845	11,216	206	14	3.9	19

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Table 4-6. (Page 3 of 3)

Locale	Statistical area	Number of		Harvest ^{a,b}	Pots lifted	Average		
		Landings	Crab ^a			CPUE ^c	Weight ^b	Deadloss ^b
Kiska	825132	5	1,156	4,741	180	6	4.1	-
	825201	6	8,633	36,005	632	14	4.2	46
	825202	3	1,544	6,522	106	15	4.2	8
	835130	7	3,915	16,003	420	9	4.1	-
	835200	8	3,108	13,014	440	7	4.2	17
	845130	7	6,183	25,606	840	7	4.1	86
	845202	12	21,597	88,625	3,015	7	4.1	289
	845230	2	223	901	54	4	4.0	-
	855200	8	4,248	17,100	562	8	4.0	52
	855231	12	16,570	67,749	1,764	9	4.1	221
	865233	1	658	2,551	120	5	3.9	15
Buldir	865301	1	493	1,913	90	5	3.9	11
	875232	1	646	3,241	272	2	5.0	367
	875301	1	648	2,611	120	5	4.0	9
Agattu	885300	1	209	899	90	2	4.3	9
Attu	895230	3	1,148	5,575	615	2	4.9	512
	895300	3	1,244	5,966	683	2	4.8	510

^aDeadloss included.^bIn pounds.^cNumber of legal crabs per pot lift.

Table 4-7. Aleutian Islands golden king crab fishery data, 1999/2000 season.

Locale	Nuner of			Harvest ^{a,b}	Pots lifted	Average		Deadloss ^b
	Vessels	Landings	Crabs ^a			Weight ^b	CPUE ^c	
East of 174° W.	15	60	709,332	3,069,886	79,129	4.3	9	84,410
West of 174° W.				FISHERY IN PROGRESS				

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lifted.

Table 4-8. Aleutian Islands scarlet king crab fishery data, 1992 to 1999.

Year	Number of			Harvest ^{a,d}	Pots Pulled	Value		Average		
	Vessels	Landings	Crabs ^a			Ex-vessel ^b	Fishery ^c	Weight ^d	CPUE	Deadloss ^d
1992 Dutch Harbor Adak						NO LANDINGS CONFIDENTIAL				
1993 Dutch Harbor Adak						NO LANDINGS NO LANDINGS				
1994 Dutch Harbor Adak	6	10	6,624	21,308	7,520	\$1.76	\$0.02	3.2	<1	10,829
Total	7	10	6,624	21,308	7,520	\$1.88	\$0.02	3.1	<1	10,829
1995 Dutch Harbor Adak	3	3	6,270	13,871	5,706	\$2.18	\$0.03	2.2	1	1,755
	6	18	19,544	49,126	15,046	\$1.82	\$0.09	2.5	1	2,066
Total	8	21	25,814	62,997	20,752	\$1.89	\$0.11	2.4	1	3,821
1996 Dutch Harbor Adak	3	10	10,190	20,924	10,247	\$1.78	\$0.03	2.0	1	3,990
	4	13	10,133	24,076	19,170	\$1.80	\$0.04	2.4	<1	1,861
Total	7	23	20,323	45,000	29,417	\$1.79	\$0.07	2.2	<1	5,851
1997 Aleutian Islands	3	12	2,698	6,720	21,217	\$1.40	\$0.01	2.5	<1	408
1998 Aleutian Islands	7					CONFIDENTIAL				
1999 Aleutian Islands	2					CONFIDENTIAL				

^aDeadloss included.^bPrice per pound.^cMillions of dollars.^dIn pounds.

Table 4-9. Eastern Aleutian District Tanner crab fishery data, 1973/74-1999.

Season	Number of			Harvest ^{a,b}	Pots lifted	Average		Deadloss ^b
	Vessels	Landings	Crabs			Weight ^b	CPUE ^c	
1973/74	6	14	210,539	498,836	NA	2.4	60	0
1974/75				CONFIDENTIAL				
1975/76	8	13	219,166	534,295	4,646	2.4	47	0
1976/77	12	35	544,755	1,239,569	9,640	2.3	57	0
1977/78	15	198	1,104,631	2,494,631	29,855	2.3	37	0
1978/79	20	174	542,081	1,280,115	18,618	2.4	20	0
1979/80	18	107	352,819	886,487	18,040	2.4	20	NA
1981	29	119	264,238	654,514	21,771	2.4	12	NA
1982	31	138	332,260	739,694	30,109	2.2	11	NA
1983	23	107	250,774	547,830	22,168	2.1	11	NA
1984	16	91	104,761	239,585	11,069	2.3	9	NA
1985	6	56	71,918	165,529	5,620	2.3	13	NA
1986	9	37	73,187	167,339	10,244	2.3	7	NA
1987	7	63	71,338	160,292	5,294	2.2	13	NA
1988	19	130	129,468	309,918	11,011	2.4	12	NA
1989	12	109	144,746	326,396	14,685	2.2	10	NA
1990	10	75	73,269	171,785	6,858	2.3	11	0
1991	5	27	21,511	50,038	1,849	2.3	12	0
1992	4	29	42,096	98,703	2,963	2.3	14	0
1993	7	34	51,441	118,609	3,530	2.3	15	0
1994	8	120	71,962	166,545	6,323	2.3	11	40

-Continued-

Table 4-9. (Page 2 of 2)

Season	Number of			Harvest ^{a,b}	Pots lifted	Average		Deadloss ^b
	Vessels	Landings	Crabs			Weight ^b	CPUE ^c	
1995				FISHERY CLOSED				
1996				FISHERY CLOSED				
1997				FISHERY CLOSED				
1998				FISHERY CLOSED				
1999				FISHERY CLOSED				

^aDeadloss included beginning 1980.

^bIn pounds.

^cNumber of legal crabs per pot lift.

Table 4-10. Eastern Aleutian District Tanner crab fishery economic performance data, 1973/74-1999.

Season	Date		Number of		Harvest ^{a,b}	Pots lifted	Value	
	Opened	Closed	Vessels	Landings			Ex-vessel ^c	Fishery ^d
1973/74	1-Oct	31-Jul	6	14	498,836	NA	NA	
1974/75	18-Jan	15-Oct	CONFIDENTIAL					
1975/76	20-Jan	15-Oct	8	13	534,295	4,646	\$0.20	\$0.11
1976/77	7-Nov	15-Jun	12	35	1,239,569	9,640	\$0.30	\$0.38
1977/78	1-Nov	15-Jun	15	198	2,494,631	29,855	\$0.38	\$0.95
1978/79	1-Nov	15-Jun	20	174	1,280,115	18,618	\$0.52	\$0.67
1979/80	1-Nov	15-Jun	18	107	886,487	18,040	\$0.52	\$0.46
1981	15-Jan	15-Jun	29	119	654,514	21,771	\$0.58	\$0.38
1982	15-Feb	15-Jun	31	138	739,694	30,109	\$1.25	\$0.92
1983	15-Feb	15-Jun	23	107	547,830	22,168	\$1.20	\$0.66
1984	15-Feb	15-Jun	16	91	239,585	11,069	\$0.98	\$0.23
1985	15-Jan	15-Jun	6	56	165,529	5,620	\$1.30	\$0.22
1986	15-Jan	15-Jun	9	37	167,339	10,244	\$1.50	\$0.25
1987	15-Jan	15-Jun	7	63	160,292	5,294	\$2.00	\$0.32
1988	15-Jan	10-Apr	19	130	309,918	11,011	\$2.10	\$0.65
1989	15-Jan	7-May	12	109	326,396	14,685	\$2.90	\$0.95
1990	15-Jan	9-Apr	10	75	171,785	6,858	\$1.85	\$0.32
1991	15-Jan	31-Mar	5	27	50,038	1,849	\$1.25	\$0.06
1992	15-Jan	31-Mar	6	29	98,703	2,963	\$1.75	\$0.18
1993	15-Jan	31-Mar	7	34	118,609	3,530	\$1.70	\$0.20
1994	15-Jan	31-Mar	8	120	166,505	6,323	\$2.35	\$0.39

-Continued-

Table 4-10. (Page 2 of 2)

Season	Date		Number of		Harvest ^{a,b}	Pots lifted	Value	
	Opened	Closed	Vessels	Landings			Ex-vessel ^c	Fishery ^d
1995					FISHERY CLOSED			
1996					FISHERY CLOSED			
1997					FISHERY CLOSED			
1998					FISHERY CLOSED			
1999					FISHERY CLOSED			

^aDeadloss included beginning 1980.

^bIn pounds.

^cPrice per pound.

^dMillions of dollars.

Table 4-11. Eastern Aleutian District grooved Tanner crab fishery data, 1993-1999.

Year	Number of			Harvest ^{a,b}	Pots lifted	Average		Deadloss ^b	Value	
	Vessels	Landings	Crabs ^a			Weight ^b	CPUE ^c		Ex-vessel ^d	Fishery ^e
1993				CONFIDENTIAL						
1994	3	27	426,230	759,239	38,106	1.8	11	19,474	\$1.73	\$1.3
1995	7	51	494,522	850,427	75,259	1.7	6	28,338	\$1.57	\$1.3
1996	3	24	55,593	106,071	24,199	1.9	2.1	7,659	\$1.00	\$1.0
1997				NO LANDINGS						
1998				NO LANDINGS						
1999				NO LANDINGS						

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lift.

^dPrice per pound.

^eMillions of dollars.

Table 4-12. Eastern Aleutian District triangle Tanner crab fishery data, 1993-1999.

Year	Number of			Harvest ^{a,b}	Pots lifted	Average		Deadloss ^b	Value	
	Vessels	Landings	Crabs ^a			Weight ^b	CPUE ^c		Ex-vessel ^d	Fishery ^e
1993						NO LANDINGS				
1994						NO LANDINGS				
1995	2					CONFIDENTIAL				
1996	2					CONFIDENTIAL				
1997						NO LANDINGS				
1998						NO LANDINGS				
1999						NO LANDINGS				

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lift.

^dPrice per pound.

^eMillions of dollars.

Table 4-13. Western Aleutian District Tanner crab fishery data, 1973-1999.

Year	Number of			Harvest ^{a,b}	Pots lifted	Average		Deadloss ^b
	Vessels	Landings	Crabs ^a			Weight ^b	CPUE ^c	
1973/74	7	12	31,079	71,887	2,390	2.3	13	NA
1974/75					CONFIDENTIAL			
1975/76					CONFIDENTIAL			
1976/77					NO LANDINGS			
1977/78	6	7	103,190	237,512	2,700	2.3	38	NA
1978/79	6	9	84,129	197,244	4,730	2.3	18	0
1979/80	10	12	147,843	337,297	5,952	2.3	25	NA
1980/81	9	23	95,102	220,716	7,327	2.3	13	0
1981/82	17	43	364,164	838,697	21,910	2.3	17	6,470
1982/83	61	125	225,491	488,399	40,450	2.2	6	7,662
1983/84	31	86	171,576	384,146	20,739	2.2	8	200
1984/85	31	41	75,009	163,460	13,416	2.2	6	1,000
1985/86	15	30	98,089	206,814	7,999	2.1	12	0
1986/87	8	24	19,874	42,761	10,878	2.1	2	200
1987/88	15	37	63,545	141,390	7,453	2.2	9	200
1988/89	36	77	69,280	148,997	18,906	2.1	4	233
1989/90	12	30	22,937	48,746	6,204	2.1	4	3,810
1990/91	5	21	6,901	14,779	1,309	2.1	5	125
1991/92	8	8	3,483	7,825	986	2.2	4	NA
1992/93					CONFIDENTIAL			
1993/94					NO LANDINGS			
1994/95					NO LANDINGS			
1995/96					CONFIDENTIAL			
1996/97					NO LANDINGS			
1997/98					NO LANDINGS			
1998/99					NO LANDINGS			

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot pull.

Table 4-14. Western Aleutian District commercial Tanner crab fishery economic data 1973-1999.

Year	Value	
	Ex-vessel ^a	Fishery Total
1973/74	NOT AVAILABLE	
1974/75	CONFIDENTIAL	
1975/76	CONFIDENTIAL	
1976/77	NO LANDINGS	
1977/78	\$ 0.38	\$90,255
1978/79	\$ 0.53	\$104,539
1979/80	\$ 0.52	\$175,394
1980/81	\$ 0.54	\$119,187
1981/82	\$ 1.30	\$1,081,895
1982/83	\$ 1.27	\$610,536
1983/84	\$ 0.95	\$364,749
1984/85	\$ 1.30	\$211,198
1985/86	\$ 1.40	\$289,540
1986/87	\$ 1.50	\$63,842
1987/88	\$ 2.10	\$296,499
1988/89	\$ 1.00	\$148,764
1989/90	\$ 1.00	\$44,936
1990/91	\$ 1.25	\$18,318
1991/92	\$ 1.00	\$7,825
1992/93	CONFIDENTIAL	
1993/94	NO LANDINGS	
1994/95	NO LANDINGS	
1995/96	CONFIDENTIAL	
1996/97	NO LANDINGS	
1997/98	NO LANDINGS	
1998/99	NO LANDINGS	

^aPrice per pound.

Table 4-15. Western Aleutian District grooved Tanner crab fishery data, 1992-1999.

Year	Harvest ^{c,d}	Vessels	Pots lifted	Value		Average		Deadloss ^d
				Ex-vessel ^b	Fishery ^c	Weight ^d	CPUE ^e	
1992				CONFIDENTIAL				
1993				NO LANDINGS				
1994				CONFIDENTIAL				
1995	145,795	6	17,749	\$1.52	\$0.195	1.9	4	17,190
1996				CONFIDENTIAL				
1997				NO LANDINGS				
1998				NO LANDINGS				
1999				NO LANDINGS				

^aDeadloss included.

^bPrice per pound.

^cMillions of dollars.

^dIn pounds.

^eNumber of legal crabs per pot lift.

Table 4-16. Aleutian District Dungeness crab fishery data, 1974-1999.

Year	Season Dates	Number of			Harvest ^{a,b}	Pots lifted	Average		Price per Pound
		Vessels	Landings	Crabs ^a			Weight ^b	CPUE ^c	
1974	01/01-12/31	3	13	24,459	60,517	3,399	2.4	8	NA
1975	01/01-12/31				CONFIDENTIAL				
1976	05/01-12/31				NO LANDINGS				
1977	05/01-12/31				NO LANDINGS				
1978	05/01-12/31				CONFIDENTIAL				
1979	05/01-12/31				CONFIDENTIAL				
1980	05/01-12/31				NO LANDINGS				
1981	05/01-12/31				NO LANDINGS				
1982/83	05/01-02/01				CONFIDENTIAL				
1983/84	05/01-02/01				CONFIDENTIAL				
1984/85	05/01-02/01	4	50	40,128	91,739	13,555	2.3	3	\$1.35
1985/86	05/01-02/01	4	19	8,590	17,830	1,706	2.1	5	NA
1986	05/01-12/31				CONFIDENTIAL				
1987	05/01-12/31	5	43	13,247	26,627	2,987	2	4	\$0.95
1988	05/01-12/31	6	45	10,814	22,634	2,581	2.1	4	\$0.90
1989	05/01-12/31	4	31	5,165	11,124	2,078	2.1	2	\$0.90
1990	05/01-12/31	3	11	8,379	17,365	1,345	2.1	6	\$0.90
1991	05/01-12/31	4	14	3,654	7,412	732	2	5	\$1.25
1992	05/01-12/31	4	13	2,854	5,649	555	2	5	\$0.83
1993	05/01-12/31	5	12	3,448	7,531	797	2.2	4	\$0.78
1994/95	05/01-01/01				NO LANDINGS				
1995/96	05/01-01/01				NO LANDINGS				
1996/97	05/01-01/01				NO LANDINGS				
1997/98	05/01-01/01				NO LANDINGS				
1998/99	05/01-01/01				NO LANDINGS				

^aDeadloss included.^bIn pounds.^cNumber of legal crabs per pot lift.

Table 4-17. Aleutian Islands District trawl shrimp fishery data, 1972-1999.

Season	Date		Number of		Tows	Harvest ^a	Value	
	Opened	Closed	Vessels	Landings			Exvessel ^b	Fishery ^c
1972	1/1	12/1	CONFIDENTIAL					
1973	1/1	12/1	CONFIDENTIAL					
1974	1/1	12/1	7	88	721	5,749,407	NA	NA
1975	1/1	12/1	4	14	54	467,196	NA	NA
1976	1/1	12/1	8	66	689	3,670,609	\$0.07	\$0.26
1977/78	2/1	3/1	7	93	1,372	6,800,393	\$0.12	\$0.82
1978/79	4/1	3/1	7	74	1,007	4,946,350	\$0.15	\$0.74
1979/80	4/1	2/1	7	68	799	3,292,049	\$0.20	\$0.66
1980	3/1	12/1	4	60	711	2,454,829	\$0.23	\$0.56
1981	3/1	12/1	6	45	551	2,185,326	\$0.22	\$0.48
1982	5/1	6/1	CONFIDENTIAL					
1983			NO LANDINGS					
1984			NO LANDINGS					
1985			NO LANDINGS					
1986			NO LANDINGS					
1987			NO LANDINGS					
1988			NO LANDINGS					
1989			NO LANDINGS					
1990			NO LANDINGS					
1991			NO LANDINGS					
1992	1/1	12/1	4	6	94	72,133	NA	NA
1993			NO LANDINGS					
1994			NO LANDINGS					
1995			NO LANDINGS					
1996			NO LANDINGS					
1997			NO LANDINGS					
1998			NO LANDINGS					
1999	1/1	7/9	2	CONFIDENTIAL				

^aIn pounds.^bPrice per pound.^cIn millions of dollars.

Table 4-18. Aleutian Islands miscellaneous shellfish fishery data 1996-1999.

Year	Fishery	Number of		Number of Pots		Harvest ^a	CPUE ^b	Deadloss
		Vessels	Landings	Registered	Pulled			
1996	Octopus	8	NA		17,800	66,152		0
	Sea Urchins	6	15 ^c		3,701	3,701		0
	Sea Cucumbers				NO LANDINGS			
	Hair Crab				NO LANDINGS			
	Snails				NO LANDINGS			
	<i>Paralomis multispina</i>				NO LANDINGS			
1997	Octopus	18	233			96,118		0
	Sea Urchins				NO LANDINGS			
	Sea Cucumbers				NO LANDINGS			
	Hair Crab				NO LANDINGS			
	Snails				NO LANDINGS			
	<i>Paralomis multispina</i>				NO LANDINGS			
1998	Octopus				CONFIDENTIAL			
	Octopus ^d		226			50,581		
	Sea Urchins				NO LANDINGS			
	Sea Cucumbers				NO LANDINGS			
	Hair Crab				NO LANDINGS			
	Snails				NO LANDINGS			
	<i>Paralomis multispina</i>				NO LANDINGS			

-Continued-

Table 4-18. (Page 2 of 2)

Year	Fishery	Number of		Number of Pots		Harvest ^a	CPUE ^b	Deadloss
		Vessels	Landings	Registered	Pulled			
1999	Octopus ^d	58	338			133,850		
	Sea Urchins				NO LANDINGS			
	Sea Cucumbers				NO LANDINGS			
	Hair Crab				NO LANDINGS			
	Snails				NO LANDINGS			
	<i>Paralomis multispina</i>				NO LANDINGS			

^aDeadloss included.

^bNumber of legal crabs per pot pull.

^cDives

^dOctopus bycatch.

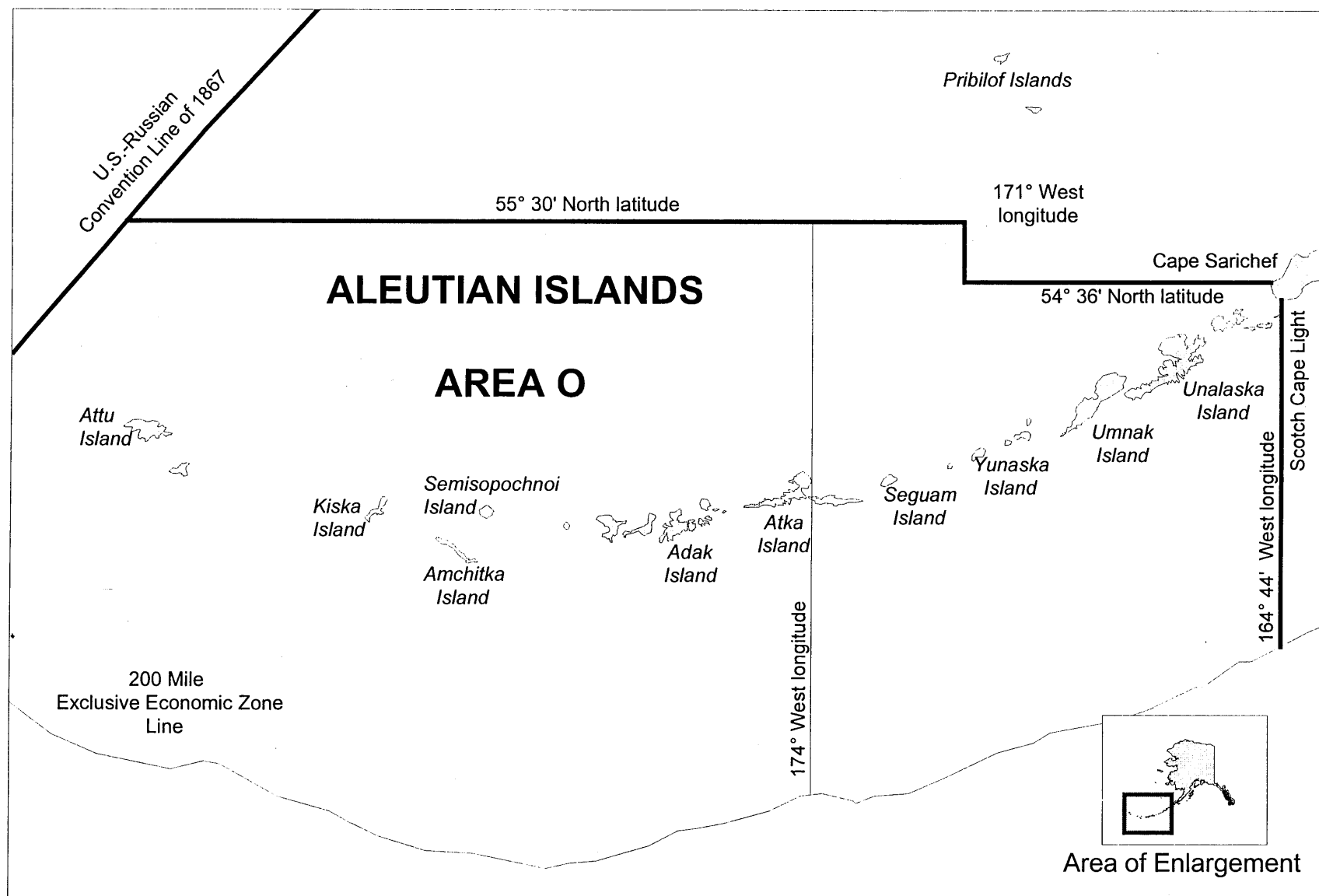


Figure 4-1. Aleutian Islands king crab Registration Area O.

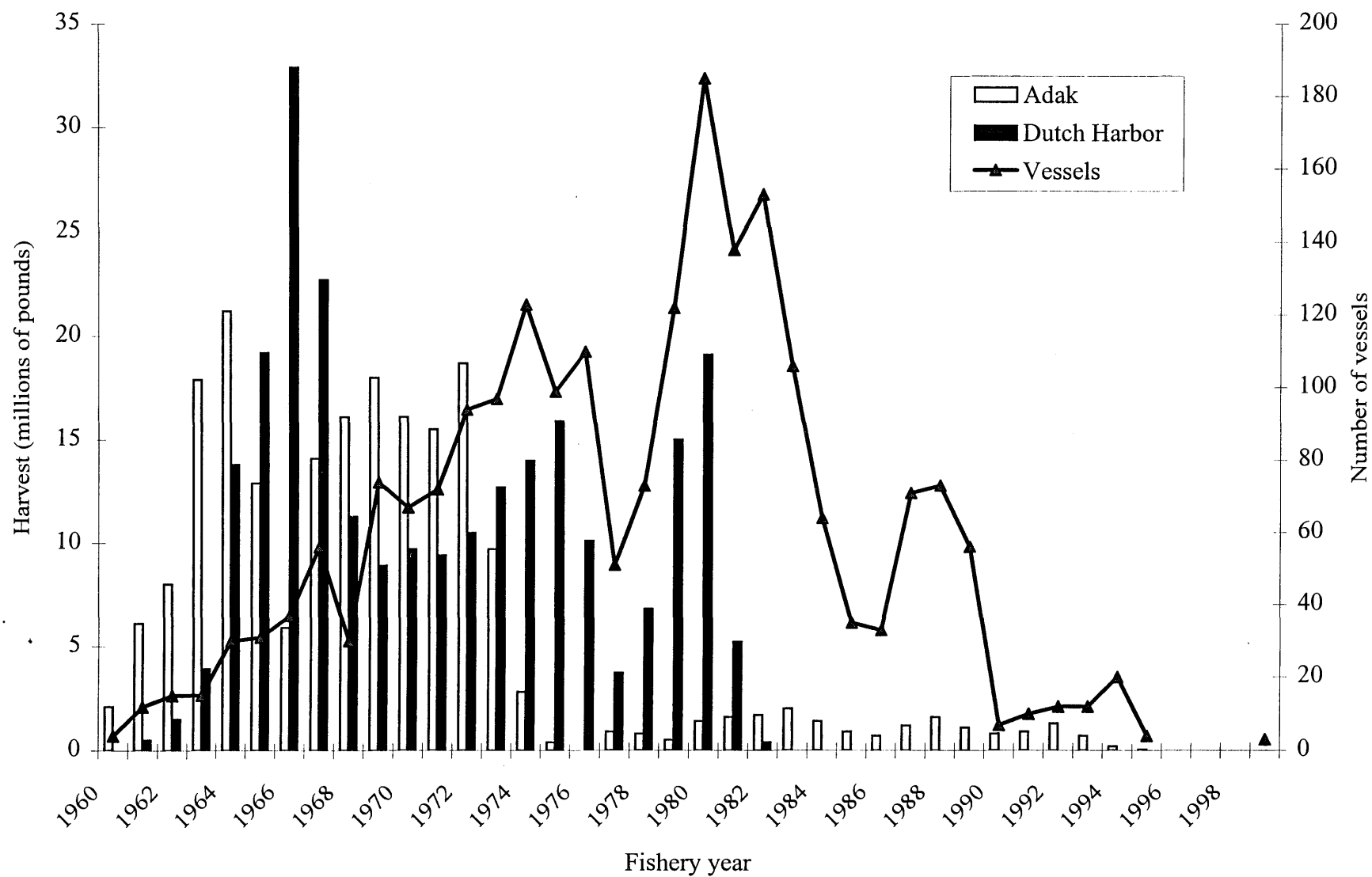


Figure 4-2. Aleutian Islands red king crab fishery harvest and effort, 1960-1999.

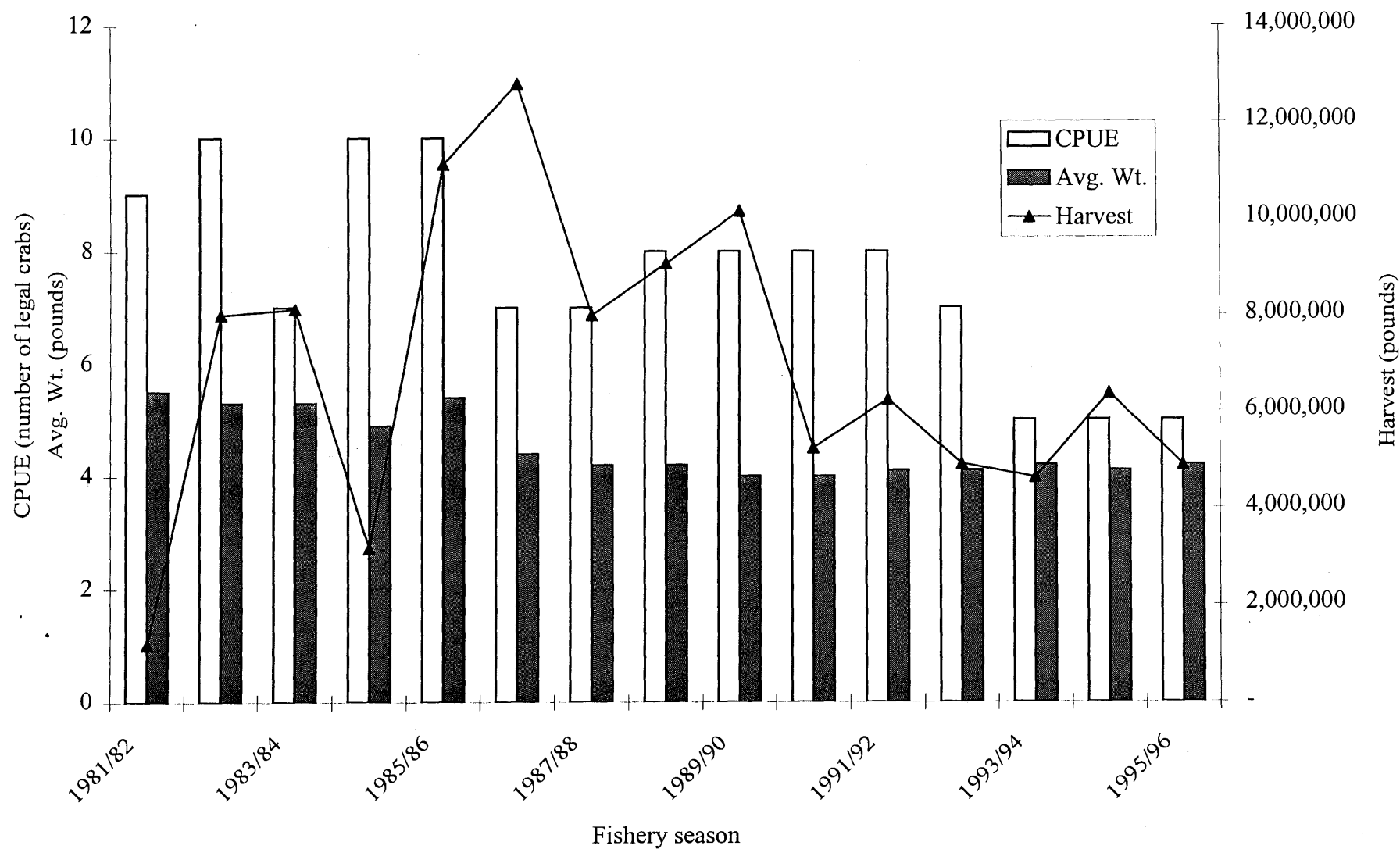


Figure 4-3. Adak area golden king crab fishery harvest, fishery performance and average weight data, 1981/82-1995/96 seasons.

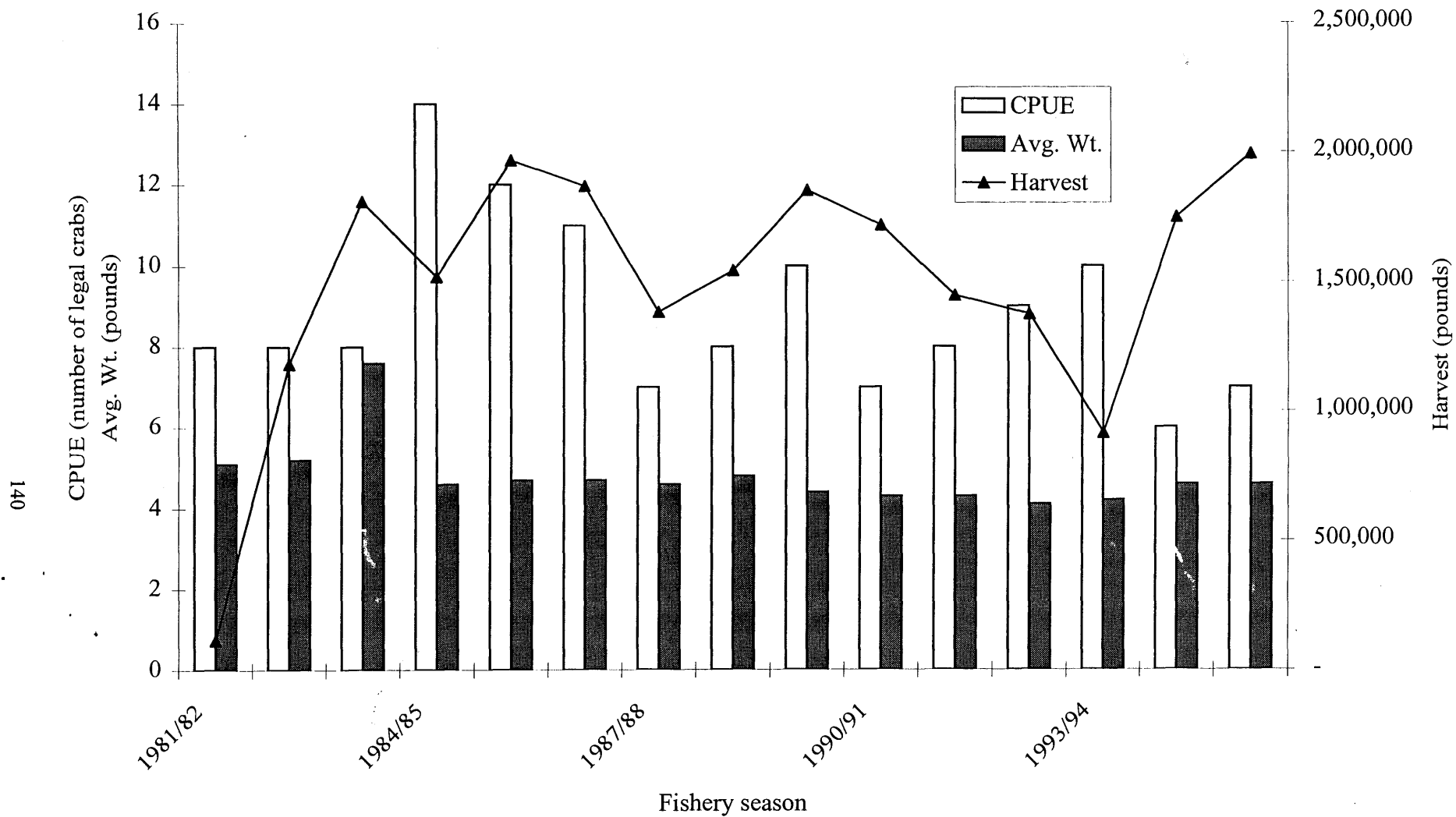


Figure 4-4. Dutch Harbor area golden king crab fishery harvest, fishery performance and average weight data, 1981/82-1995/96 seasons.

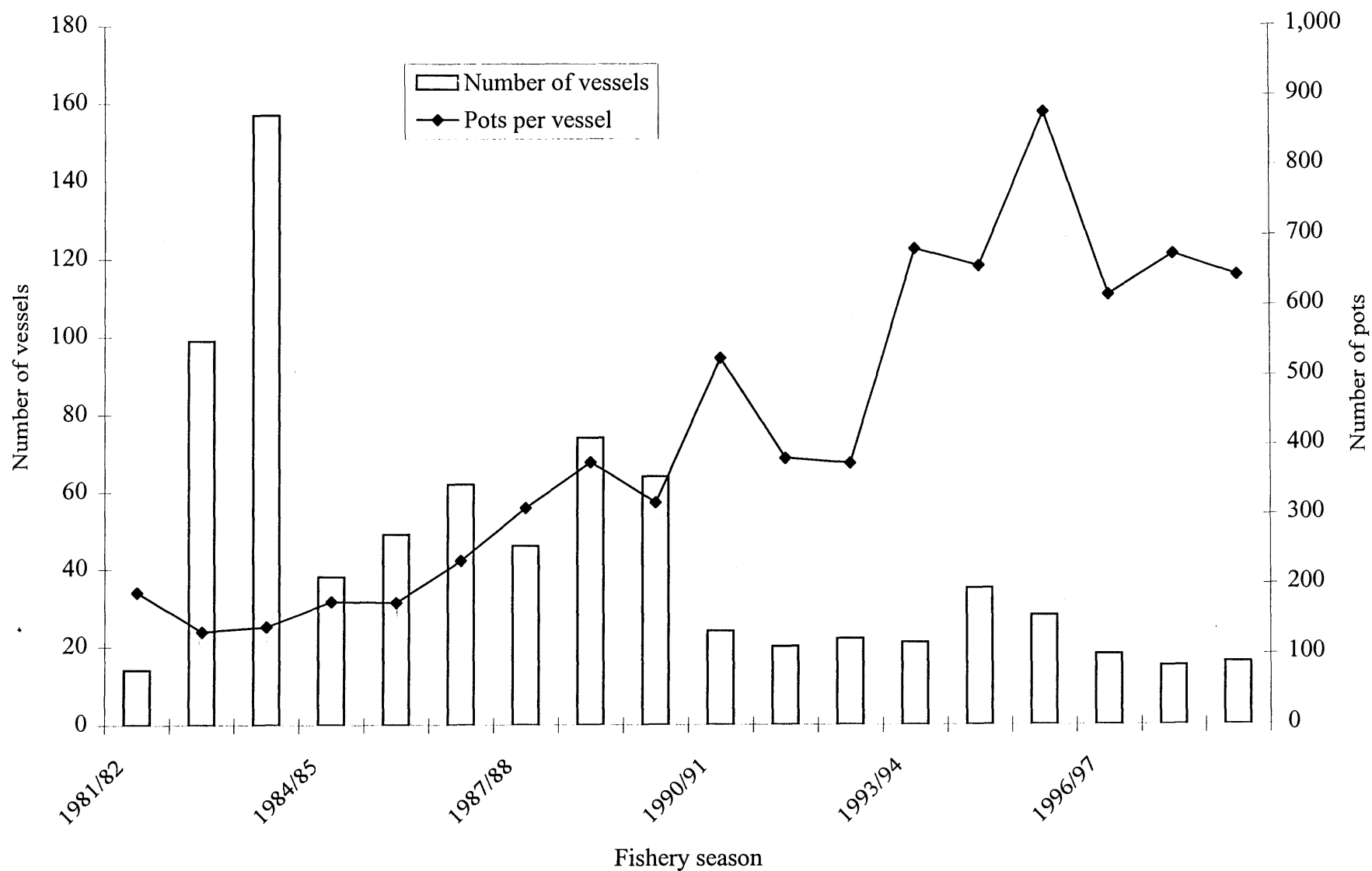


Figure 4-5. Aleutian Islands golden king crab fishery vessel registrations and number of pots per vessel 1981/82 to 1998/99 seasons.

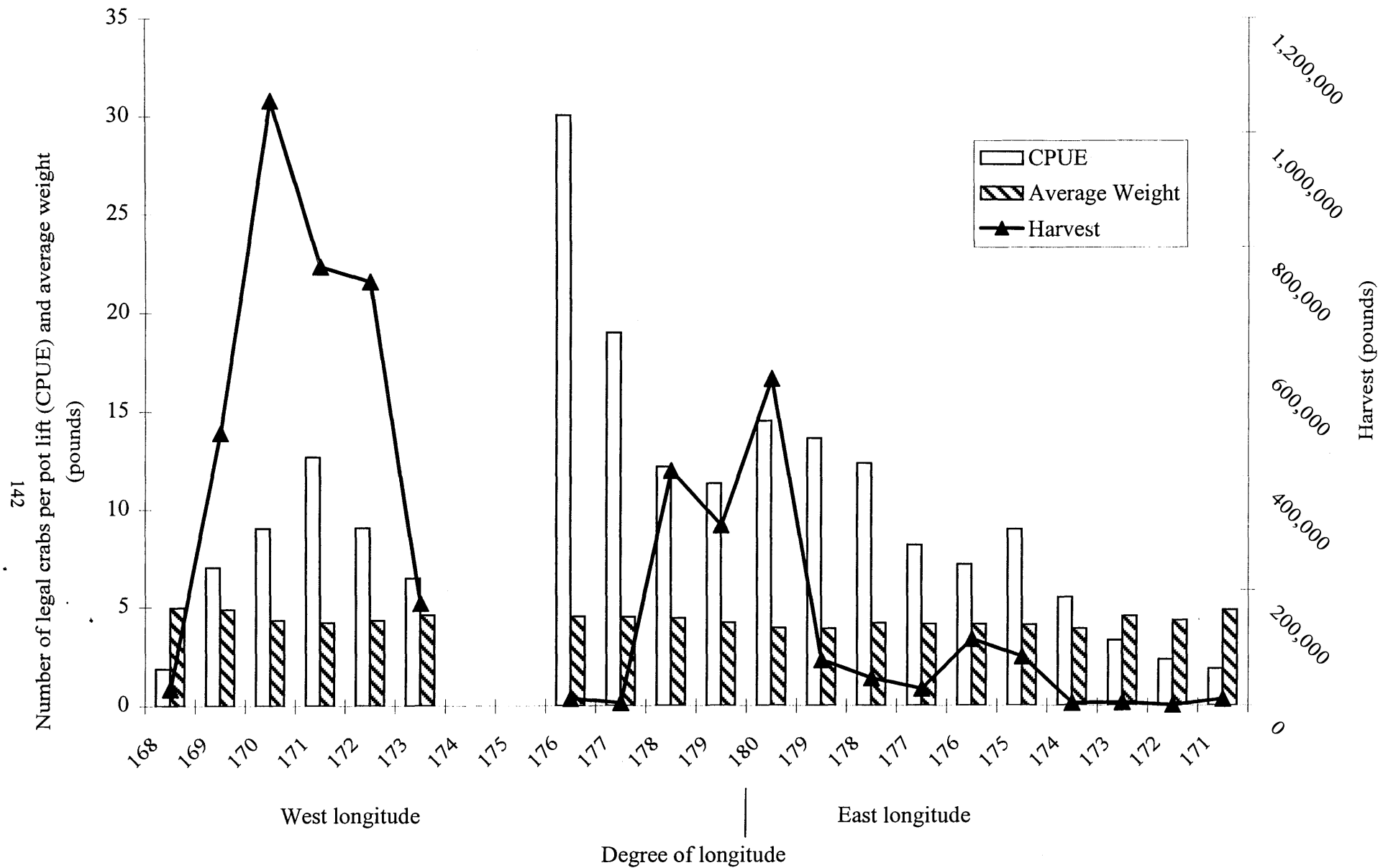


Figure 4-6. Aleutian Islands golden king crab fishery harvest, catch per unit of effort and average weight data by degree of longitude, 1998/99 season.

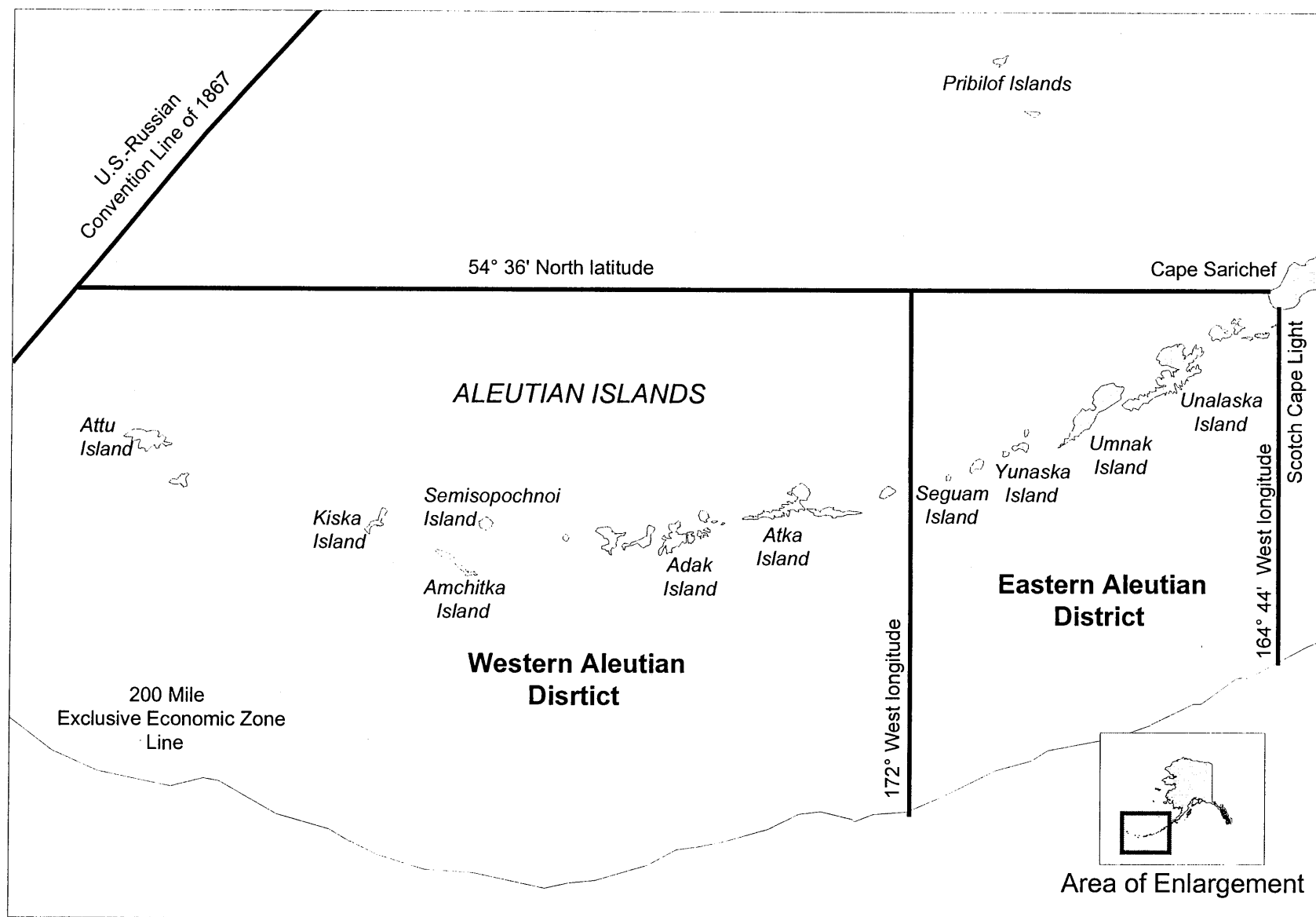


Figure 4-7. Eastern and western Aleutian Districts of Tanner crab Registration Area J.

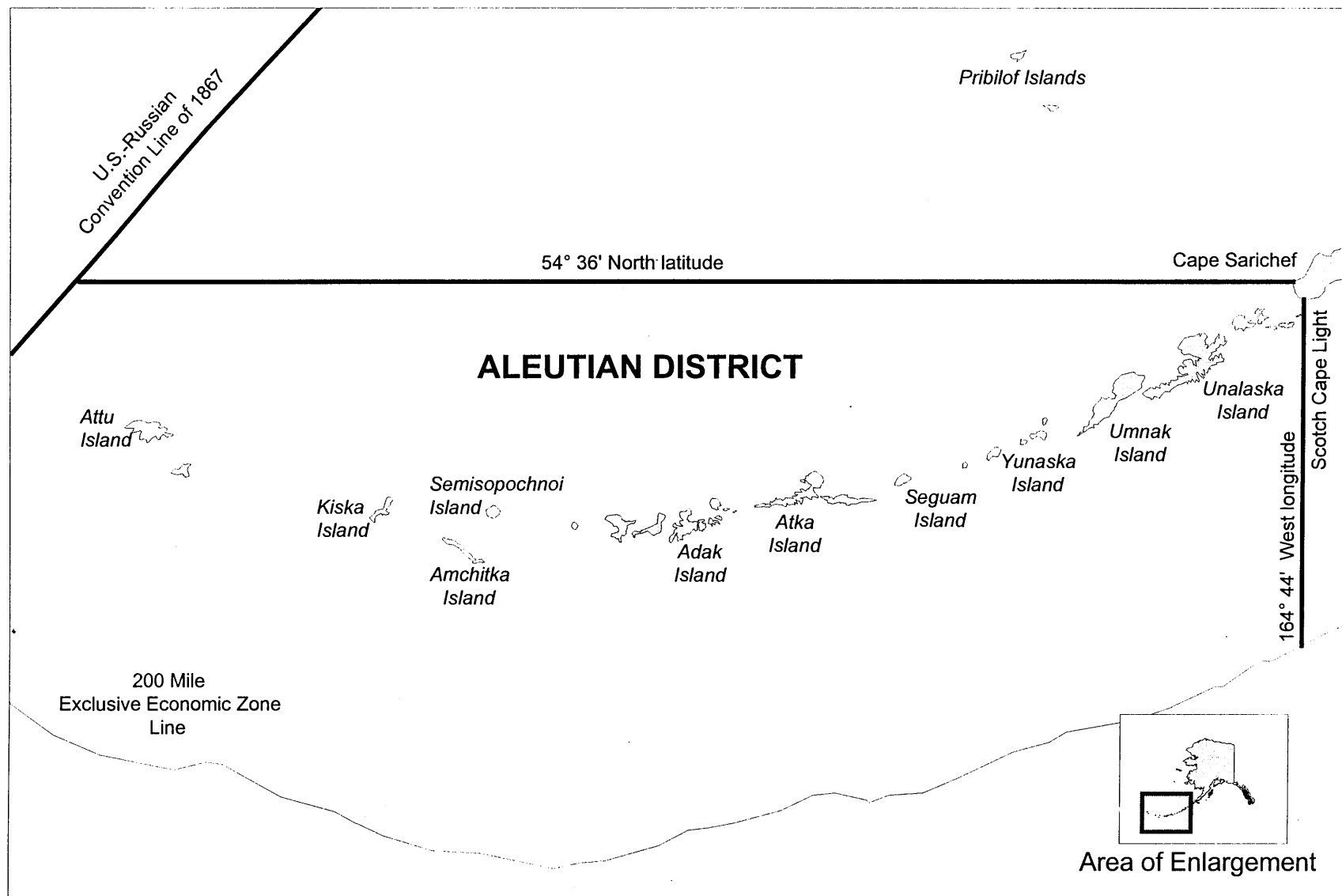


Figure 4-8. Aleutian Islands Dungeness crab management district.

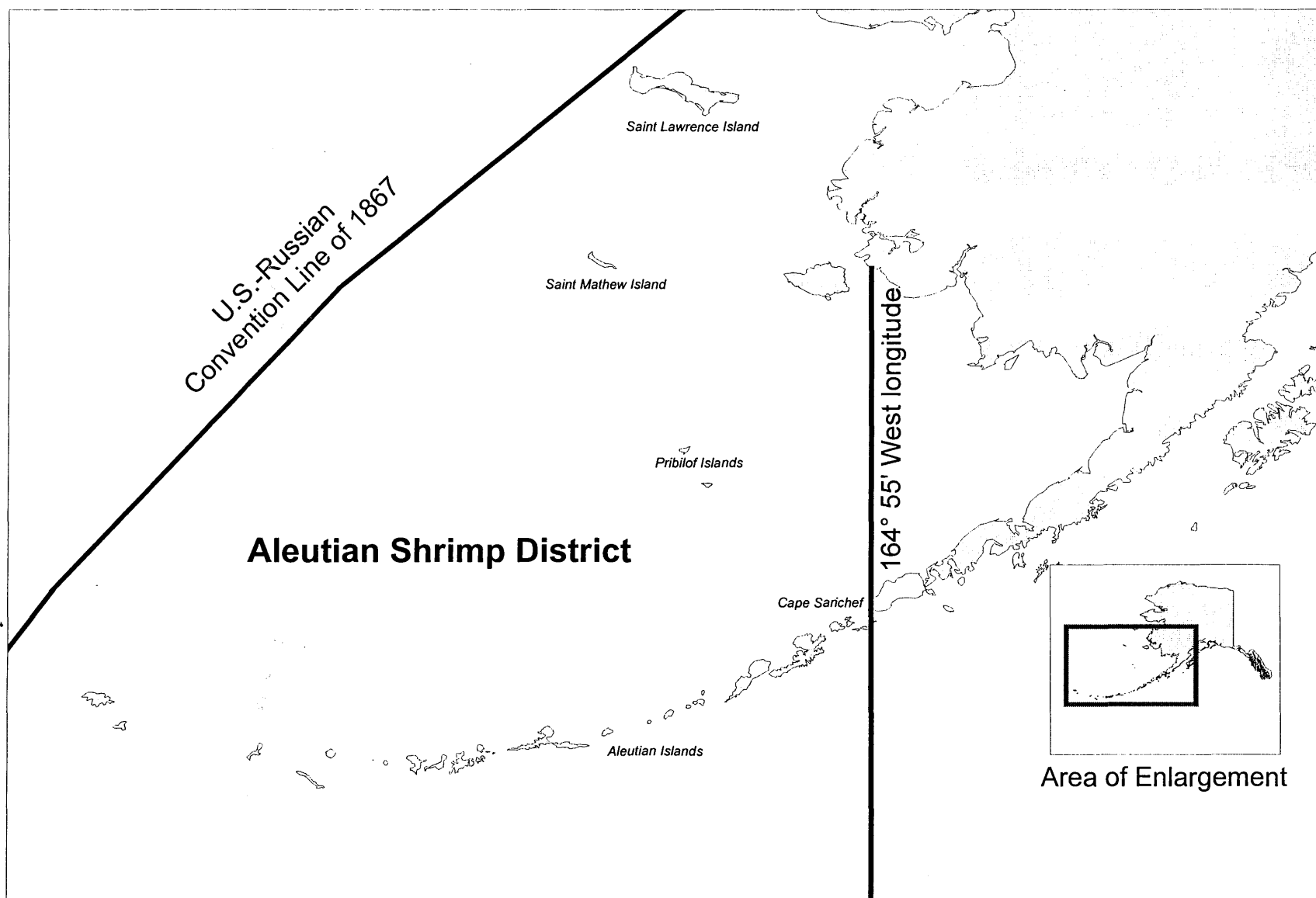


Figure 4-9. Aleutian shrimp management district.

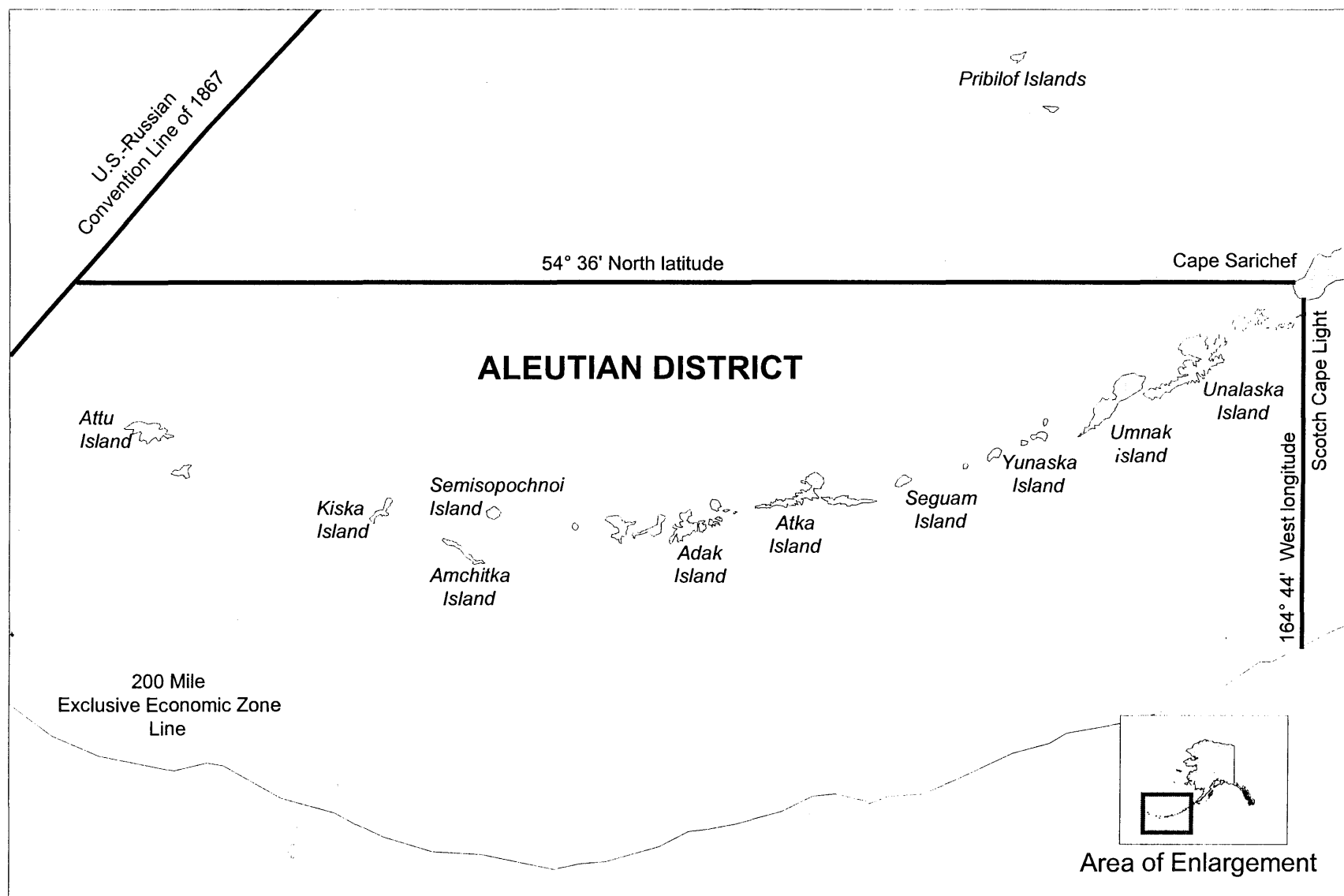


Figure 4-10. Aleutian Islands miscellaneous shellfish management district.

ANNUAL MANAGEMENT REPORT FOR THE
SHELLFISH FISHERIES OF THE BERING SEA

By

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KING CRAB REGISTRATION AREA T BRISTOL BAY

Description of Area

The Bristol Bay king crab Management Area T includes all waters north of Cape Sarichef, east of 168° W long. and south of the latitude of Cape Newenham and includes all waters of Bristol Bay (Figure 5-1).

Historic Background

Commercial fishing for red king crabs *Paralithodes camtschaticus* in the Bering Sea began with Japanese harvests in 1930. Their presence continued in this fishery until 1940 and then again from 1953 until 1974. The Russian king crab fleet operated in the eastern Bering Sea from 1959 through 1971. U.S. fishers entered the eastern Bering Sea fishery with trawl gear in 1947. Effort and catches declined in the 1950s with no catch being reported in 1959. A period of fluctuating low catches followed through 1966 before expanding into a full-scale domestic fishery in the late 1970s.

The red king crab fishery in the eastern Bering Sea traditionally harvested crabs from waters north of Unimak Island and the Alaska Peninsula from Cape Sarichef to Port Heiden. With the decline of king crab stocks in other areas of the state in 1968, U.S. effort increased in the eastern Bering Sea with a record catch of 129.9 million pounds in 1980 (Figure 5-2 and Table 5-1). King crab stocks in much of the state, including Bristol Bay, declined severely in the early 1980s and have since remained at depressed levels.

In 1980, the Alaska Board of Fisheries (BOF) defined that portion of the Bering Sea south of Cape Newenham and east of 168° W long. as the Bristol Bay King Crab Registration Area T. At that time, the area was designated an exclusive registration area. During any king crab registration year (June 28 through June 27), vessels registering for and fishing in this area are prohibited from fishing in any other exclusive or super exclusive registration areas. Only non-exclusive areas (the Bering Sea Area Q and or Aleutians Area O) can subsequently be fished by a vessel once registered in Area T.

The National Marine Fisheries Service (NMFS) has conducted annual trawl abundance index surveys of the eastern Bering Sea since 1968. This multi-species (crab and groundfish) survey is conducted during the summer months and the resulting area-swept estimates of abundance are published annually. In 1983, the NMFS trawl survey of the Bering Sea indicated a record low number of legal male crabs and the lowest total king crab population ever recorded. Small female crabs carrying fewer eggs and high predator abundance was also noted. Consequently, the fishery was closed for the 1983 season. The fishery reopened in 1984 and catches slowly increased to over 20.3 million pounds in 1990. Due to the large number of catcher-processors and floating processors in the fishery and the inability of the Alaska Department of Fish and Game (ADF&G) to monitor these catches, an onboard observer program was initiated in 1988. Fishing effort increased dramatically from 89 vessels in 1984 to over 300 vessels in 1991 (Table 5-1). The number of pots being fished by the fleet also increased, with almost 90,000 pots registered for the 1991 fishery, compared to 21,762 pots registered in 1984.

Due to the increased number of pots, the BOF established a 250 pot limit, which was implemented for the 1992 Bristol Bay red king crab fishery. This measure was intended to improve manageability of the fishery by extending the length of the season as well as reducing the potential for pot loss. Pot limits were applied through a buoy sticker program.

Immediately following the 1992 Bristol Bay red king crab fishery, the 250 pot limit was repealed by the NMFS. This action was due to perceived inconsistencies with provisions of the Bering Sea/Aleutian Islands King and Tanner Crab Federal Management Plan (FMP), which mandated application of pot limits in a nondiscriminatory manner. In the spring of 1993, the BOF passed new regulations, which set pot limits based on overall vessel length. For the Bristol Bay red king crab fishery, vessels in excess of 125 feet in overall length were limited to 250 pots and vessels 125 feet and under in length overall were allowed a total of 200 pots. These pot limits were applied through a buoy tag program from the Dutch Harbor and Kodiak ADF&G offices.

Voluntary daily vessel reports received via single side band radio and marine telex have been used to manage the Bristol Bay red king crab fishery since 1993. That season ran for 9 days and the total harvest was 14.6 million pounds, approximately 2.2 million pounds short of the 16.8 million pound harvest guideline midpoint.

Results from the NMFS 1994 summer trawl survey of the Eastern Bering Sea indicated declines in all size classes of both male and female red king crab in the Bristol Bay area. Compared to observations made during the 1993 survey, the abundance index of large male crabs declined 25%. Based on the 1994 survey results, large female abundance was estimated at 7.5 million crabs, which was below the minimum threshold of 8.4 million crabs necessary to allow a fishery. As a result, the Bristol Bay red king crab fishery was not open for the 1994 season.

Due to potential measurement errors in the area-swept trawl abundance estimates, the ADF&G developed a length-based analysis (LBA) for estimating population abundance. This method, used for the first time prior to the 1995 season, incorporates a variety of data sources including dockside sampling and observer-collected data as well as data collected on the annual NMFS survey. The LBA is less susceptible to year-to-year variations in factors unrelated to population abundance (oceanographic conditions, changes in species distribution and subsequent availability to the survey gear, etc.) and is therefore likely to produce a more accurate estimation of abundance. Analysis of the 1995 NMFS survey using the LBA model indicated no significant difference in the abundance of mature male and female red king crab from estimates made from the 1994 survey (Zheng et al. 1995). Based on these combined results, the Bristol Bay red king crab fishery remained closed for the 1995 season.

Due to the depressed nature of the Bristol Bay red king crab population, the BOF, at their March 1996 meeting, adopted a revised harvest strategy to promote stock rebuilding. One of the most significant changes to the harvest strategy was a reduction in the exploitation rate of mature male crabs from 20% down to 10% at biomass levels below where the stock is considered rebuilt (55 million pounds of effective spawning biomass).

Results from the LBA incorporating the 1996 NMFS survey data indicated increased abundance in all size classes of males and females compared to the 1995 estimate (Zheng et al. 1996). Of major importance was an increase in the number of large females in 1996 to 10.2 million crabs, which was well above the 8.4 million large female threshold necessary to allow a fishery. This was a

significant increase relative to the prior two years where fishery closures were due to insufficient numbers of large female crabs. Based on a 10% exploitation rate, the 1996 GHL was set at 5.0 million pounds. The 1996 fishery lasted four days and a total of 8.4 million pounds were harvested. This was 68% over the 5.0 million pound GHL.

Stemming from the ADF&G's inability to adequately manage this fishery at low GHL levels, the BOF held a special meeting in August of 1997 implementing new pot limits and vessel pre-registration requirements. Also adopted were regulations which extended the tank inspection window for the Bristol Bay red king crab fishery from 24 to 30 hours and allowed fishermen to leave baited pots on the fishing grounds after a closure announcement of less than 24 hours. New pot limits were based on vessel overall length, the pre-season GHL, and the number of vessels which pre-registered for the fishery. These new pot limit regulations were adopted with a sunset provision of December 31, 1998, to provide for reevaluation at the 1999 BOF meeting. Specific information on pot limits, based on GHL and number of vessels participating in the Bristol Bay fishery, are found under 5 AAC 34.825 of the 1998-99 Commercial Shellfish Fishing Regulations.

The LBA using the 1997 NMFS survey data indicated that while all components of the Bristol Bay red king crab stock increased from levels observed in 1996 (Zheng et al. 1997), the effective spawning biomass was below the 55 million pound threshold necessary to allow a 15% harvest rate. Therefore, a 10% exploitation rate was used, which generated a GHL of 7.0 million pounds for the 1997 season. Based on the GHL and number of vessels which filed a preseason registration, pot limits were set at 100 and 125 pots for small and large vessels, respectively. The 1997 fishery lasted only four days and a total of 8.8 million pounds were harvested. The 1997 season total exceeded the GHL by 24% largely due to extremely high fishery performance in the final hours of the fishery.

Analysis of the 1998 NMFS survey data indicated the abundance of pre-recruit male red king crabs increased by 85%, resulting in an increase in the fishable stock of mature male crabs for the 1998 season. The abundance of large females (>89 mm carapace length) increased by 42% (Stevens et al. 1998). The effective spawning biomass was estimated to be over 55 million pounds, resulting in a 15% harvest rate on mature male crabs. The GHL for the 1998 open access fishery was 15.8 million pounds. Because the GHL was in excess of 12 million pounds, the preseason registration requirement was waived and pot limits were set at 200 and 250 for small and large vessels, respectively. Total harvest in the 1998 fishery, which lasted five days, was 14.3 million pounds.

At their March 1999 meeting, the BOF made permanent those interim management measures which were adopted in the fall of 1997. The BOF also passed an anti-prospecting regulation which prohibits vessels from participating in the Bristol Bay king crab fishery if they have operated pot or trawl gear in the Bristol Bay Management Area in the 30 days prior to the king crab season. However, a provision was made for vessels when trawling in Area T during the 30 days prior to the red king crab season. In order for these vessels to participate in the Bristol Bay red king crab fishery, a vessel trawling must carry a NMFS approved observer for the entire 30 days prior to the opening. The BOF also passed a regulation which moved the opening date of the commercial red king crab fishery in Bristol Bay from November 1 to October 15.

1999 Fishery

The 1999 Bristol Bay red king crab fishery opened at 4:00 p.m. on October 15, 1999, two weeks earlier than in recent years. The change to an earlier opening was intended to improve fleet and industry efficiency by reducing the time between the Bristol Bay red king crab fishery and the Bering Sea king crab fisheries, which open on September 15.

The GHL for the 1999 open access fishery was 10.1 million pounds. An additional 533,000 pounds was set aside for the Community Development Quota (CDQ) fishery scheduled to take place after completion of the open access harvest. A total of 274 vessels filed preseason registrations for the 1999 Bristol Bay red king crab fishery by the September 24, 1999 deadline. Based on the number of vessels registered and the GHL, a pot limit of 160 and 200 was established for vessels less than or equal to 125 and over 125 feet, respectively.

A total of 262 vessels purchased 42,792 buoy tags for the 1999 Bristol Bay king crab fishery. However, only 259 actually registered and received tank inspections for the fishery. In 1998, 275 vessels purchased 56,420 buoy tags.

Pre-tank and gear inspections were again available prior to the fishery. In the pre-tank inspection process, ADF&G personnel inspect vessel tanks and gear in the five to seven days leading up to the regular tank inspection period. Pre-inspected vessels are then eligible to obtain a "Quick Registration" (have their registrations signed and validated) by ADF&G staff stationed at most major processors at the start of the regular tank inspection window. Pre-tank and gear inspections were available in Dutch Harbor beginning October 8, King Cove on October 9, and in Akutan on October 10. Pre-tank inspections were not available in Saint Paul due to the limited size of that harbor.

Regular tank inspections began at 10:00 a.m. on October 14, 30 hours before the fishery opening. ADF&G staff conducted a total of 150 tank inspections in Dutch Harbor, 63 in King Cove, 44 in Akutan, and two in St. Paul Harbor. Approximately 85% of the fleet in all inspection locations, except St. Paul, received a pre-tank inspection and took advantage of the Quick Registration process. Consequently, the majority of vessels were registered and on their way to the fishing grounds by 11:00 a.m. on October 14. In addition to vessel hold inspections, ADF&G staff examined fishing gear aboard all vessels for pot mesh, tag and tunnel size requirements.

For the first time ever, United States Coast Guard (USCG) personnel accompanied ADF&G staff during pre-tank inspections in the port of Dutch Harbor and examined vessel stability records and pot loading practices. Of the 150 vessels which were inspected by ADF&G, USCG personnel boarded 75, and found pot overloading on two. Both overloaded vessels were required to remove excess pots prior to departure to the fishing grounds.

A total of 257 vessels, including 8 catcher-processors, made 268 landings in the open access fishery for a total harvest of 11.1 million pounds of red king crabs. The 1999 open access fishery lasted 5.2 days and was closed by emergency order at 9:00 p.m. on October 20. One floating processor also registered and purchased crabs on the grounds during the fishery.

The 1999 Bristol Bay king crab fishery was managed by means of daily inseason reports from fishers rather than a predetermined season length based on current effort and past fishery

performance. Based on the GHL, number of vessels, pots registered, and historical catch per pot pull (CPUE) data, the department projected the fishery would last between 2.5 to 3.5 days. A projected fishery length of less than five days is considered problematic to manage inseason due to insufficient data, and hence a high potential to exceed the GHL. However, results of ADF&G cost recovery fishing in Bristol Bay just prior to the fishery revealed broader than normal crab distribution and catch rates well below levels observed from past years' pre-season test fishing. This information suggested the potential of lower than expected catch rates and a final harvest in a short, pre-announced fishery, well below the GHL. As a result, the department elected to manage the fishery inseason and take into account daily variations in catch and weather to increase the potential of achieving a harvest closer to the GHL.

A total of 173 vessel operators or 67% of participants, from both the small (≤ 125 feet) and large (> 125 feet) vessels groups, volunteered to report number of pots fished and number of crabs retained daily. Reports were received via marine telex each 12 hours and over single side band radio each 24 hours. The total number of vessels which actually reported during the fishery ranged from 108 (42% of fleet) on October 16, to 32 vessels (12% of fleet) on October 20. These numbers, which are similar to the percentage of vessels which reported in 1998, include the eight catcher-processors which were required to report daily via single side band radio. A sharp decline in the number of vessels reporting was observed after the fishery closure was announced on October 19.

Fishery performance, in legal crabs per pot pull (CPUE), calculated from inseason reports from fishers, ranged from 4.1 on October 16 to 13.7 on October 18. Overall fishery performance for the 1999 fishery was 12.2 catch per pot pull, down from the 15 CPUE observed for the 1998 season. Daily projected harvest ranged from less than 15,000 pounds on the first reporting day to over 2.5 million pounds on October 19. Based on daily catch reports, which indicated the 10.1 million pound GHL would be reached by 9:00 p.m. on October 20, a closure was announced over single side band radio at 8:25 p.m. on October 19, approximately 24 hours prior to the closure. The fishery closure announcement was faxed or emailed to all processors and fisheries-related organizations on the department's Westward Region fax distribution list. Because fishers were given 24 hours advanced notice of the fishery closure, all fishing gear remaining on the grounds at the time of the closure was required to be unbaited, with pot doors secured open.

Total number of pots pulled per day, projected from inseason reports, ranged from less than 500 on October 15 to over 33,000 on October 20. Total number of pots actually pulled during the 1999 fishery was 146,997; a 4% increase from the 141,707 total pot lifts recorded for the 1998 fishery. Comparing the 146,997 total pot pulls reported during the 1999 fishery to the 42,749 pots registered indicates fishers pulled their pots approximately 3.4 times over the course of the 1999 fishery. This compares to an average of 2.5 pulls for each pot registered in the 1998 fishery. The higher number of lifts per pot for the 1999 season reflects significant gear movement and shorter soak times during the first several days of the fishery as fishers attempted to locate productive grounds.

Exvessel price of Bristol Bay red king crabs for the 1999 open access season was \$6.25 per pound. This is the highest price paid for red king crabs in the history of this fishery. Based on a preliminary harvest of 11.1 million pounds, the 1999 fishery generated a total value of approximately \$69.4 million. This compares to the 1998 fishery exvessel price of \$2.64 per pound and total open access fishery value of \$37.4 million (Figure 5-3 and Table 5-2).

Inseason information from catcher-processors indicated the average weight of red king crabs harvested in 1999 was 6.3 pounds. Post season information from fishtickets and dockside sampling indicated an overall average weight of 6.1 pounds; a nine percent reduction from the 6.7 pound average weight observed in the prior three seasons. The reduction in the average weight of crabs captured during the 1999 season is due to a higher than average number of first year recruit crabs in the population. Mean carapace length of crabs harvested in 1999 was 148 millimeters. This is a reduction from the 152 mm average observed during the 1997 and 1998 fisheries (Table 5-3).

ADF&G dockside biologists sampled 123 (63%) of the 194 deliveries made to shore-based processors in the ports of Dutch Harbor, Akutan, St. Paul and King Cove. Samplers also examined the catch and collected information on 100% of the 11 landings made to the port of Kodiak. Analysis of these dockside data indicated that 28% of the 1999 harvest was made up of post-recruit (old-shell crabs ≥ 137 mm and new-shell crabs ≥ 153 mm) crabs. This compares to 60% and 72% post-recruits crabs landed during the 1998 and 1997 seasons, respectively (Table 5-3).

The majority of the 1999 harvest came from six statistical areas located in the central and south west portions of the Bristol Bay Management Area between 162° and 164° W long. and 55° 30' and 57° N lat. (Table 5-4). This is, for the most part, within the traditional area of harvest and the same general area where the majority of the harvest occurred in 1997 and 1998. However, approximately 10% of this year's total harvest came from an area slightly south and west of where the fleet normally fishes.

Weather conditions on the fishing grounds were relatively calm throughout most of the 1999 fishery. A storm front, still dissipating on opening day of the fishery, slowed the fleet's arrival on the fishing grounds and caused minor damage to several vessels. Weather observations from the grounds, at the time of the closure, indicated northwest winds in excess of 35 knots. These conditions did not prevent vessels from having all their gear unbaited at the time of the closure, and all but a few vessels were able to reach their intended port of delivery within the 30 hours following the closure, as allowed by regulation.

Enforcement presence on the fishing grounds included two patrol vessels and one surveillance aircraft. Both enforcement vessels pulled pots before, during and after the season, and seized a number of pots which were not in compliance with current regulations for the Bristol Bay king crab registration area. In addition, the enforcement aircraft, using specialized surveillance equipment, documented at least one case of early fishing. In addition to state enforcement presence, the US Coast Guard had two high endurance cutters on patrol in the Bristol Bay area and a helicopter detachment stationed at Cold Bay for potential search and rescue operations.

Prior to the 1999 open access red king crab fishery in Bristol Bay, cost recovery fishing was conducted by the ADF&G on a chartered vessel. This cost recovery fishery, which harvested and sold 79,600 pounds of red king crabs, worth \$478 thousand, is an ongoing program used to collect funds to conduct research on Bering Sea shellfish. Immediately following the 1999 Bristol Bay open access fishery, another cost recovery fishery was conducted by the ADF&G to partially fund placement of shellfish observers on catcher vessels in Bering Sea and Aleutian Islands crab fisheries. This fishery landed 106,179 pounds of red king crabs worth \$669.5 thousand. Table 5-5 summarizes cost recovery harvest statistics in the Bristol Bay king crab

management area for the years 1990-1999. Table 5-6 summarizes the economic performance of cost recovery activities in the Bristol Bay management area 1990-1999.

Status of Stocks

Length based analysis including the 1999 NMFS survey data indicates the abundance of legal male red king crabs in Bristol Bay increased by 26%, while the number of mature male crabs increased by 14% from levels observed in 1998. However, small (95-109 mm) and pre-recruit (110-134 mm) males decreased by 57% and 27%, respectively. Large females (>89 mm carapace length) decreased 7% from last years level (Zheng, J. and G.H. Kruse 1999). Currently the effective spawning biomass (ESB) of this stock is estimated to be 47.1 million pounds. This is similar to the 1998 ESB level of 46.5 million pounds. This stock is considered stable but remains below the 55 million pound ESB threshold which defines this stock as officially rebuilt in the most current harvest strategy. Substantial reductions in the number of small and pre-recruit male and large female crabs signal a potential for future population declines in the absence of significant recruitment in the next several years.

LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game) 1998-1999. Commercial regulations, 1998 edition. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.
- Stevens, B.G., J.A. Haaga, and R.A. MacIntosh. 1998. Report to Industry on the 1998 Eastern Bering Sea Crab Survey. (Alaska Fisheries Science Center) Processed Report 98-07.
- Zheng, J., M.C. Murphy, and G.H. Kruse. 1995. Overview of population estimation methods and robust long-term harvest strategy for red king crabs in Bristol Bay. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 5J95-21, Juneau.
- Zheng, J., G.H. Kruse, and M.C. Murphy. 1996. Stock status of Bristol Bay red king crabs in 1996. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 5J96-12, Juneau.
- Zheng, J., G.H. Kruse, and M.C. Murphy. 1997. Status of king crab stocks in the eastern Bering Sea in 1997. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 5J97-13, Juneau.
- Zheng, J., G.H. Kruse. 1999. Status of king crab stocks in the Eastern Bering Sea in 1999. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 5J99-09, Juneau.

KING CRAB REGISTRATION AREA Q BERING SEA

Description of Area

The Bering Sea king crab registration Area Q includes all waters north of Cape Sarichef, south of Point Hope, and east of the U.S./Russia Convention Line of 1867 but excludes waters of Bristol

Bay, those waters west of 171° W long. and south of 55°30' N lat., and all waters south of 54°36' N latitude (Figure 5-4). Area Q is divided into the Pribilof District, which includes waters south of Cape Newenham, and the Northern District which incorporates all waters north of Cape Newenham. The Northern District is subdivided into three sections: the Saint Matthew Island Section, which includes waters north of Cape Newenham and south of Cape Romanzof; the Norton Sound Section, which includes all waters north of Cape Romanzof, south of Cape Prince of Wales, and east of 168° W long.; and the Saint Lawrence Island Section, which encompasses all remaining waters of the district.

PRIBILOF DISTRICT

Historic Background

The king crab fishery in the Pribilof District began in 1973 when vessels targeted blue king crabs *Paralithodes platypus* in the vicinity of St. George and St. Paul Islands (Figure 5-4). The first reported catch in this area was 1.2 million pounds taken by eight vessels between July 1973 and October 1974. The average weight of crabs harvested was 7.3 pounds and catch per pot pull (CPUE) was 26 crabs. By the 1980/1981 season, fishing effort had increased to 110 vessels which harvested 11.0 million pounds of crabs, the highest catch on record. However, by this time the fishery CPUE had dropped to 9 crabs and would continue declining to a low of two crabs by the end of the 1986/1987 season. Consequently, the harvest also dropped to a low of 270,000 pounds, taken by just 16 vessels (Table 5-7). Due to this dramatic six year decline in harvest, as well as concurrently low annual population estimates, the blue king crab fishery was closed beginning with the 1988/1989 season and remained closed until 1995 (Figure 5-5).

In 1993, the National Marine Fisheries Service (NMFS) summer trawl survey of the Bering Sea indicated a marked increase in the abundance of red king crabs *Paralithodes camtschaticus* around the Pribilof Islands. While no threshold level of abundance was established for Pribilof District red king crabs, survey results indicated a harvestable surplus of male crabs existed. As a result, a red king crab fishery in the Pribilof District opened for the first time in September of 1993. A harvest of 2.6 million pounds was taken from a guideline harvest level (GHL) of 3.4 million pounds. In 1994, the Pribilof District was again opened to the commercial harvest of red king crabs and 1.3 million pounds was harvested by 104 vessels.

In 1995, an increase in blue king crab abundance and a continued harvestable surplus of red king crabs resulted in a combined red and blue king crab GHL of 2.5 million pounds. Subsequent declines in red and blue king crab abundance over the next three years resulted in the combined GHL reaching a low of 1.25 million pounds in 1998 (Table 5-8). Poor fishery performance during this time resulted in annual harvests below the fishery GHL.

In 1993, the Alaska Board of Fisheries (BOF) adopted regulations which set pot limits, based on overall vessel length, for all king crab fisheries in the Bering Sea. In the Pribilof District, pot limits were established at 50 for vessels greater than 125 feet and 40 for vessels less than 125 feet.

Since 1993, season lengths have ranged from six to 14 days (Table 5-8). This compares to the eight year period from 1980-1988 when season length ranged from 10 to 86 days. Due to shorter seasons

since 1993, the Pribilof District fishery has been managed inseason using vessel catch reports. Reports are received via single side band (SSB) radio and marine satellite telex every 24 hours, and are used to calculate the CPUE and daily harvest. Inseason management of the fishery has increased the probability of achieving the GHs and allowed for close monitoring of both the emerging red king crab fishery and the rebuilding blue king crab fishery.

The economic value of the Pribilof District red king crab fishery peaked at \$13.0 million in 1993 with an exvessel price of \$4.98 per pound, the second highest on record. The value of the Pribilof District blue king crab fishery peaked at \$13.6 million in 1981/1982, with an exvessel price of \$1.50 per pound. Since 1995, the exvessel price of red or blue king crabs has not exceeded \$3.37 per pound. Total value of the fishery declined from \$6.8 million in 1995 to \$2.4 million in 1998 (Table 5-8 and Figure 5-6). The historic average weight of red king crabs in the Pribilof District is 7.8 pounds, just slightly larger than the 7.5 pound average weight of blue king crabs (Table 5-7).

1999 Fishery

The red and blue king crab fishery in the Pribilof District remained closed for the 1999 season due to a continued decline in blue king crab abundance and significant uncertainty surrounding estimated red king crab abundance. Poor fishery performance in recent years added to concerns over the health of the red and blue king crab stocks.

Stock Status

The population of blue king crabs in the Pribilof District is at its lowest level since 1989. Results from the 1999 NMFS trawl survey showed a 46% decline in abundance for both legal and pre-recruit male crabs and a 24% decline in the abundance of large females (Stevens et al. 1999). Overall, the population remains low and appears to be in a long-term decline.

The abundance of red king crabs peaked from 1992-1995 and now appears to be in decline. Results from the 1999 NMFS trawl survey showed no change in the abundance index for pre-recruit males. The abundance of legal males and large females showed a significant increase, however the majority of crabs were captured in a single survey tow. This localized, highly concentrated population of crabs resulted in an index with very low precision (Stevens et al. 1999). This grouping behavior has been observed frequently in years prior to the 1997 survey.

ST. MATTHEW ISLAND SECTION

Historic Background

The commercial blue king crab fishery in the St. Matthew Island Section of the Northern District was first exploited in 1977, resulting in a commercial harvest of 1.2 million pounds. In 1978, the catch increased to almost 2.0 million pounds (Table 5-9). Catches decreased in 1979 and 1980 due to lack of effort. In 1981, several vessels returned to the St. Matthew Island Section during the Norton Sound Section fishery. Catches were good and, after the Norton Sound Section closed,

additional vessels moved into the St. Matthew Section taking 4.6 million pounds of blue king crabs. Catch and effort increased to a peak harvest of 9.5 million pounds in 1983 when 164 vessels participated. In subsequent seasons catches remained at or below 5.0 million pounds (Figure 5-7).

NMFS trawl surveys between 1983 and 1999 in the St. Matthew Island Section of the Northern District indicated a harvestable surplus of blue king crabs ranging from 1.7 to 8.0 million pounds. In 1998, the legal male abundance decreased by 21%, resulting in a GHL of 4.0 million pounds. The 1998 season closed before the GHL was attained due to poor fishery performance and observer information indicating a relatively high incidental capture rate of sublegal males and female crabs. The actual harvest of 2.9 million pounds equaled the projected harvest (Table 5-11). The CPUE was 7 crabs per pot pull, the second lowest CPUE on record (Table 5-9). The 1998 season, which was managed based on inseason catch reports, lasted 11 days, the longest since a 17-day opening that occurred in 1983, when 9.5 million pounds were harvested (Table 5-10). In 1999, the St. Matthew fishery remained closed due to a continued decline in male and female crab abundance as seen in the NMFS survey results.

In 1993, the Alaska Board of Fisheries (BOF) adopted regulation changes and moved the opening date of the St. Matthew king crab fishery from September 1 to September 15, concurrent with the king crab fishery in the Pribilof District (Table 5-8). This action was taken to improve effort distribution between the Pribilof and St. Matthew areas, thereby reducing the number of vessels participating in each fishery. Differential pot limits, established in 1993 for the St. Matthew Island Section, limited vessels over 125 feet to 75 pots and vessels 125 feet or less to a maximum of 60 pots.

The exvessel price for St. Matthew blue king crab in 1998 averaged \$1.87 per pound, the lowest on record since 1985 when fishers were given \$1.60 per pound (Table 5-10). The total value of the 1998 fishery was \$5.3 million, a reduction from the \$9.8 million fishers received the previous year and a 64% decrease from the 1994 value of \$15.0 million (Table 5-10 and Figure 5-8). Average weight per crab has ranged from 4.0 to 5.0 pounds, fluctuating with the percentage of recruits entering the fishery each year. The average weight per crab in the 1998 fishery was 4.7 pounds (Table 5-9).

1999 Fishery

The 1999 St. Matthew Island Section blue king crab fishery remained closed due to dramatic declines in both male and female crabs in all size categories, and poor fishery performance in the 1998 fishery.

Stock Status

Analysis of the 1999 NMFS survey data estimated legal male abundance at 0.63 million crabs, an 80% decrease from the 1998 survey results and well below the 20-year average of 2.4 million crabs. Mature male crabs are at their lowest level since 1986. Pre-recruit male crabs decreased 88% from 1998, and the abundance of mature female crabs continues to show a dramatic decline (Stevens et al. 1999). Spawning biomass in 1999 was estimated at 4.8 million pounds, well below the minimum stock size threshold of 11.0 million pounds established for this stock. As defined by the

Bering Sea and Aleutian Islands King and Tanner Crab Fishery Management Plan and the Magnuson-Stevens Fishery Conservation and Management Act, this fishery is considered overfished and a rebuilding plan is being developed.

LITERATURE CITED

Stevens, B.G., J.A. Haaga, R.A. MacIntosh, and R.S. Otto. 2000. Report to Industry on the 1999 Eastern Bering Sea Crab Survey. NMFS AFSC Processed Report 2000-01.

BERING SEA GOLDEN KING CRAB

Description of Area

The Bering Sea king crab registration Area Q includes all waters north of a line from 54° 36' N. lat., 168° W. long. to 54° 36' N. lat., 171° W. long. to 55° 30' N. lat., 171° W. long. to 55° 30' N. lat., 173° 30' E. long. The northern boundary of Area Q is the latitude of Point Hope (68° 21' N. lat.), the western boundary is the U. S.-Russia Convention Line of 1867, and the eastern boundary is a line from 54° 36' N. lat., 168° W. long. to 58° 39' N. lat., 168° W. long. to Cape Newenham (58° 39' N. lat.). Area Q is subdivided into the Pribilof and Northern Districts at Cape Newenham (58° 39' N. lat.). The Northern District is further divided into three sections. The Norton Sound Section consists of all waters east of 168° W. long., north of Cape Romanzof (61° 49' N. lat.), and south of the latitude of Cape Prince of Wales (65° 36' N. lat.), the Saint Matthew Island Section includes all waters north of Cape Newenham and south of Cape Romanzof; and the Saint Lawrence Island Section includes all remaining waters of the district (Figure 5-4).

Historic Background

The golden king crab *Lithodes aequispina* is found in only a few deep canyons in the Bering Sea District and has never sustained large harvests when compared to other Bering Sea king crab fisheries. As with many other crab fisheries in the Bering Sea, the fishery for golden king crabs was pioneered by foreign fleets. A domestic fishery developed during the 1982/83 season after the BOF directed ADF&G to open and close fishing for golden king crabs in the Pribilof District by emergency order (ADF&G 1984). By the 1984 season, the BOF directed ADF&G to manage the Area Q golden king crab fishery under authority of a commissioner's permit in order to allow the fishery to develop and expand into new areas (ADF&G 1985).

The first domestic harvest of golden king crabs in the Bering Sea occurred in June 1982 when two vessels fished in the Pribilof District before leaving for the Northern District blue king crab opening on August 1. Effort increased to 10 vessels during the following season with a harvest of nearly 70,000 pounds. The size limit for golden king crabs in the Pribilof District was reduced from six and one half inches to five and one half inches in 1983. Subsequently, effort in the Pribilof District peaked during the 1983/84 season when 50 vessels harvested 856,475 pounds of golden king crabs. Since the 1983/84 season, no more than eight vessels have registered for this fishery and harvest has not been greater than 350,000 pounds (Table 5-13). The Pribilof District golden king crab fishery

reached a maximum exvessel value of just over \$1 million in 1995 (Table 5-14). During the last 15 years, the Pribilof District fishery has been prosecuted by an average of three vessels that have harvested 147,000 pounds per year. Catch per unit of effort has averaged five legal crabs per pot lift and average weight of retained crabs has been four pounds. Most harvest in the Pribilof District occurred in the area immediately to the south of the Pribilof Island group. The fishery typically occurs in the spring, after closure of the Bering Sea snow crab fishery and in the fall, prior to the Bristol Bay red king crab fishery.

A domestic fishery for golden king crabs in the Saint Matthew Island Section of the Northern District also began in the 1982/83 season. Effort and harvest in the Northern District has been sporadic. Since the initial fishery in the 1982/83 season, harvest has only been documented during seven fishing seasons. Harvest peaked in 1987 when 11 vessels harvested 424,394 pounds (Table 5-15). Northern District economic data are available for only a limited number of years and are confidential for many of those years (Table 5-16).

There has been no documented harvest of golden king crabs from either the Saint Lawrence Island or Norton Sound Sections.

At its March 1993 meeting, the BOF imposed pot limits on all king crab fisheries in the Bering Sea. Current pot limits in the Pribilof District are 40 pots for vessels 125' or less in length and 50 pots for vessels greater than 125' in length. In the Northern District, pot limits were set at 60 pots for vessels 125' or less in length and 75 pots for vessels greater than 125' in length. These pot limits are significantly lower than the average number of pots fished per vessel in the Aleutian Islands golden king crab fishery that has no pot limits in place. The ADF&G does not require observer coverage on catcher-only vessels participating in this fishery.

1999 Fishery

Pribilof District

Three vessels registered for the 1999 Bering Sea golden king crab fishery which opened on January 1. Fishing effort began April 2, however no landings occurred until April 22. Initial catches were relatively large, averaging 25,000 pounds per week with a catch per unit of effort (CPUE) of nearly 20 legal crabs per pot lift. Over one month after the first landing, catch rates were still well above the historic average at 14 legal crabs per pot lift.

Stronger than expected catches prompted the ADF&G to develop a GHL for the Pribilof District in-season. A GHL of 200,000 pounds was established using historic catch data and provision of the Federal Fisheries Management Plan for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands. The fleet was advised of this GHL on June 4.

Inseason reports from processors indicated that the GHL would be reached by June 10 and an emergency order was issued closing the fishery at noon on June 10. The final delivery of golden king crabs from the Pribilof District was made on June 11. Harvest was 177,108 pounds from nine landings. Catch per unit of effort was 15 legal crabs per pot lift and average weight of retained crabs was four pounds. All 1999 catch occurred in three statistical areas immediately to the south of Saint George Island (Table 5-17).

Northern District

No vessels registered to fish for golden king crabs in the Northern District of Area Q during 1999.

Fishery Management and Stock Status

The golden king crab fishery in the Aleutian Islands is managed using inseason catch reports provided by processors and vessel logbooks issued with the commissioner's permit. The logbooks provide location of fishing operations, effort, and estimates of bycatch. Primary bycatch species include non-retained golden king crabs, halibut, Pacific cod and snow crabs. Observers are not required in this fishery, but will be mandatory after July 1, 2000.

The golden king crab population in the Bering Sea is not currently surveyed and no estimate of abundance has been made. There are currently no plans to survey this population, nor has a harvest strategy been developed. Future deep water trawl surveys conducted by NMFS may provide some information regarding the status of this stock. Population size is believed to be limited by the amount of available habitat in the Bering Sea.

Literature Cited

Alaska Department of Fish and Game (ADF&G). 1984. Westward Region Shellfish Report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak.

Alaska Department of Fish and Game (ADF&G). 1985. Westward Region Shellfish Report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak.

BERING SEA SCARLET KING CRAB

Historic Background

Scarlet king crabs *Lithodes couesi* are harvested under authority of a permit issued by the commissioner of the ADF&G authorized in **5 ACC 34.082 PERMITS FOR LITHODES COUESI KING CRAB**. Harvest of scarlet king crabs in the Bering Sea has primarily occurred as bycatch in the grooved Tanner crab and golden king crab fisheries. Although vessels first registered to fish for Bering Sea scarlet king crabs in 1992, no commercial landings occurred prior to 1995. In 1995, four vessels harvested 26,684 pounds and were paid an exvessel price of \$2.12 per pound. Only two vessels participated in 1996, and consequently, all catch information is confidential. No vessels registered to fish for scarlet king crabs in 1997 or 1998 (Table 5-18).

1999 Fishery

No vessels registered to harvest scarlet king crabs in the Bering Sea during 1999.

Fishery Management and Stock Status

No annual abundance estimates are available for scarlet king crab stocks, nor have any stock assessment surveys targeted them. Onboard observers have been required on most vessels targeting deepwater crab species since 1994 and have collected information detailing the size and sex composition of the retained and non-retained scarlet king crab and bycatch species. This information will be used to help develop management measures for these stocks in the future. Currently, the ADF&G does not intend to register any vessels to fish directly for scarlet king crabs in the Bering Sea pending BOF adoption of the Plan for the Development of New Fisheries In Alaska. Any additional directed fishing for scarlet king crabs will be conducted in accordance with that plan. Retention of scarlet king crabs captured in other deep-water crab fisheries may be permitted.

BERING SEA TANNER CRAB MANAGEMENT DISTRICT

Description of Area

The Bering Sea District of Tanner crab Registration Area J includes all waters of the Bering Sea north of the latitude of Cape Sarichef at 54°36' N lat. and east of the U.S.-Russian Convention Line of 1867. This district is divided into the Eastern and Western Subdistricts by a line at 173° W longitude. The Eastern Subdistrict is further divided at the latitude of Cape Romanzof and 168° W long. into the Norton Sound section to the east and the General Section to the west (Figure 5-9).

BERING SEA TANNER CRAB

Historic Background

The first reported catches of Tanner crabs, *Chionoecetes bairdi*, occurred in 1968, incidental to the harvest of red king crabs, *Paralithodes camtschaticus*, in Bristol Bay. In 1974, a directed Tanner crab fishery began. Harvest peaked at 66.6 million pounds during the 1977/78 season. In the fall of 1978, the National Marine Fisheries Service (NMFS) predicted sharp declines in Tanner crab abundance beginning with the 1978/79 fishing season. As anticipated, Tanner crab stocks declined and, by 1984, the commercial harvest fell to 1.2 million pounds. Further stock declines lead to a fishery closure during the 1986 and 1987 seasons (Table 5-19 and Figure 5-10).

In 1992, in an effort to slow the harvest rate to provide sufficient time for inseason management of the Tanner crab fishery, the Alaska Board of Fisheries (BOF) adopted regulations which restricted all participating vessels to fishing a maximum of 250 pots. In 1993, in order to comply with federal law regarding application of pot limits in a nondiscriminatory manner, differential pot limits, based on vessel length, were implemented. Vessels less than or equal to 125 feet overall length were limited to a maximum of 200 pots. Vessels longer than 125 feet overall length were limited to a maximum of 250 pots.

Also in 1993, the BOF adopted regulations which opened and closed that portion of the Eastern Subdistrict east of 168° W long. to fishing for Tanner crabs concurrent with the regulatory opening and emergency order closure of the Bristol Bay red king crab fishery. The BOF mandated a reopening of the Eastern Subdistrict between 163° and 173° W long. for the directed Tanner crab fishery 10 days after the closure of the Bristol Bay red king crab fishery. In the event the Bristol Bay red king crab fishery failed to open, that portion of the Eastern Subdistrict west of 163° W long. would open to a directed Tanner crab fishery on November 1. These BOF actions were based on observer bycatch data and historic harvest patterns which indicated the majority of female king crab bycatch in the Bristol Bay red king crab and Bering Sea Tanner crab fisheries came from waters east of 163° W longitude.

During the 1994 and 1995 seasons, the Bristol Bay red king crab fishery did not open due to low stock abundance. As a result, the Tanner crab fishery opened on November 1 in that portion of the Eastern Subdistrict west of 163° W longitude. The commercial Tanner crab harvest in 1994 was 7.8 million pounds; in 1995 the harvest declined to 4.2 million pounds (Table 5-20).

The guideline harvest level (GHL) for the 1996 Tanner crab fishery was 8.4 million pounds (Table 5-21). Due to poor fishery performance, the fishery was closed before the GHL was reached; a total of 1.8 million pounds was harvested (Table 5-19 and Figure 5-10). The average size of crabs harvested in 1996 was 152.1 mm carapace width (CW). This compares to an average CW of 149.3 observed in 1995. The percentage of newshell crabs harvested in 1996 decreased to 46.6% from the 58.6 % observed in the 1995 harvest (Table 5-22).

Based on poor fishery performance in 1996 and results from the 1997 NMFS survey indicating significant declines in most segments of the Tanner crab population, the Bering Sea Tanner crab fishery remained closed for the 1997 season (Stevens et al. 1998a). The 1998 NMFS survey indicated further declines in Tanner crab abundance and the fishery did not open in 1998. Abundance of large male and female Tanner crabs continued to decline to the lowest level in the history of the survey. However, pre-recruit crabs showed an increase in 1998, indicating the potential for improved recruitment in the near future (Stevens et al. 1998b).

1999 Fishery

Due to low stock abundance, the Bering Sea Tanner crab fishery remained closed for the 1999 season.

Status of Stocks

Results from the 1999 NMFS Eastern Bering Sea Trawl Survey indicated the overall estimated Tanner crab abundance increased from levels observed in 1998. Estimated legal male abundance was low at 2.0 million crabs (4.4 million lbs.), changing little from 1998. Estimated abundance of mature females increased 148% to 16.1 million crabs (13.9 million lbs.) and pre-recruits increased 20% to 14.5 million crabs, from 1998 (Stevens et al. 2000).

At the March 1999 meeting, the BOF adopted regulations for a revised harvest strategy as part of a comprehensive Bering Sea Tanner crab rebuilding plan. The harvest strategy for the Eastern

Subdistrict specifies a threshold of 21.0 million pounds of mature female biomass which, for management purposes, are females ≥ 80 mm CW. No directed crab fishery is prosecuted when female biomass is below that threshold. When the mature female biomass is between 21.0 million but less than 45.0 million pounds, a maximum harvest rate of 10% is applied to "molting mature males". When the mature female biomass is above 45.0 million pounds the harvest rate is set at a maximum of 20% of molting mature males. Molting mature males are those mature male crabs that are likely to continue to grow and are defined as 100% of newshell and 15% of oldshell males greater than 112 mm CW.

When establishing a GHL, no more than 50% of the exploitable legal-size male abundance may be harvested. Exploitable legal-size male abundance is 100% of newshell and 32% of oldshell male crabs greater than 140 mm CW. Separate GHLs are calculated for the areas east and west of 166° W long.

The minimum fishery threshold is 4.0 million pounds. If the fishery is not opened because it did not meet threshold requirements, the fishery may reopen the following season if at least 8.0 million pounds of harvestable surplus is available, but only half of the harvestable surplus may be taken that year. If the fishery is unable to achieve the 8.0 million pound level, the fishery may reopen the following year if the calculated GHL is at least 4.0 million pounds. This safeguard was established to protect against survey bias in the year following a closure due to low stock abundance.

BERING SEA SNOW CRAB

Historic Background

The first commercial landings of snow crabs, *Chionoecetes opilio*, from the Bering Sea were recorded in 1977, incidental to the harvest of Tanner crabs. In 1981, a reduction in the Tanner crab harvest resulted in increased snow crab harvest. The harvest of snow crabs fell from 52.8 million pounds in 1981 to 26.1 million by 1983 (Table 5-23 and Figure 5-11). In 1984, the harvest increased slightly, and in 1985, the fishery produced a 66 million pound harvest. In 1986 the harvest increased to 98.0 million pounds. The commercial catch continued to increase annually to a high of 328.6 million pounds in 1991. Although stocks began to decline, the harvest of snow crabs remained over 100 million pounds through the 1994 season. In 1996, the harvest declined to 65.7 million pounds, the lowest in the preceding eleven seasons. In 1997, the GHL more than doubled to 117.0 million pounds and the fleet harvested 119.5 million pounds (Table 5-24). In 1998, the open access GHL increased to 225.9 million pounds and 243.3 million pounds were harvested by 229 vessels. An additional 8.9 million pounds of snow crabs were harvested by 21 vessels in the Community Development Quota (CDQ) fishery which was first implemented in 1998.

1999 Fishery

The 1999 open access snow crab fishery opened by regulation at 12:00 noon on January 15, 1999. A total of 241 vessels, including 12 catcher-processors, registered and received tank inspections in Akutan, Dutch Harbor, King Cove and Saint Paul Island. In addition, 11 floating processors registered to purchase and process crabs on the grounds during the fishery.

The harvest for the 1999 open access snow crab fishery was 184.5 million pounds from 1,630 landings (Table 5-23). At 12:00 noon on March 12, an announcement was made to close the open access fishery, effective at 12:00 noon on March 22, 1999 (Table 5-25). Following the open access closure, 23 vessels harvested 9.67 million pounds of snow crabs in the CDQ fishery.

Based on the 1998 NMFS Eastern Bering Sea Trawl Survey, the 1999 GHLL was set at 196.0 million pounds; 162.7 million pounds in the Eastern Subdistrict and 33.3 million pounds in the Western Subdistrict. Since the CDQ allocation was set at five percent of the total harvest, not the GHLL, the CDQ allocation of 9.67 million pounds was determined after the conclusion of the open access fishery.

Registration for the 1999 Bering Sea snow crab fishery began on January 13 in Akutan, Dutch Harbor and King Cove and on January 14 in Saint Paul. Pre-tank inspections began on January 7 in Dutch Harbor, January 9 in King Cove and January 10 in Akutan. Due to space limitations of the Saint Paul harbor and the difficulty in keeping track of vessels once outside the harbor, pre-tank inspections were not available at Saint Paul. A total of 236 vessels initially registered; 149 received tank inspections in Dutch Harbor while 47, 20, and 20 were inspected at King Cove, Akutan and Saint Paul, respectively.

A price dispute between fishers and processors delayed startup of the catcher vessel component of the fleet until January 18. However, the 10 catcher-processors which were registered began fishing immediately. An additional five vessels registered and participated in the snow crab fishery after participating in the Bering Sea pollock fishery, which closed on February 28.

Based on weekly processor production reports, harvest in the 1999 fishery peaked at 23.8 million pounds delivered during the week ending January 30. Harvest remained relatively stable until the week ending March 20, when severe storm conditions in the Bering Sea reduced the fleet's effectiveness and only 11.9 million pounds were landed and processed. In the final two days of the fishery and the five days following the fishery closure, 15.7 million pounds were landed.

In the Eastern Subdistrict, the weekly harvest peaked at 22.5 million pounds for the week ending January 30 (Figure 5-12). The total season harvest for this area was 134.1 million pounds from 1,386 landings. In the Western Subdistrict, the weekly harvest peaked at 8.7 million pounds for the week ending March 6. The total season harvest for this area was 48.6 million pounds from 388 landings (Tables 5-26 and 5-27).

Fishery performance, measured in number of large males (≥ 4.0 " CW) per pot lift, ranged from 216 for the week ending January 23 to 97 for the week ending March 6. The season average catch per unit effort (CPUE) was 158 (Table 5-26). In the Eastern Subdistrict, CPUE ranged from 226 in the week ending January 23 to 90 in the week ending March 6. In the Western Subdistrict, CPUE ranged from 235 in the week ending January 30 to 100 in the week ending March 6. These CPUE estimates represent a decrease from levels observed during the 1998 fishery (Table 5-26 and Figure 5-12).

Preliminary analysis of observer and dockside sampling data indicates an average weight of 1.3 pounds for crabs landed during the 1999 fishery. Newshell crabs made up 97.7% of the 1999 harvest (Table 5-23). Preliminary analysis also indicates approximately 13.7% of the harvest was

composed of sub-four inch crabs. This compares to 9.7%, 21.1% and 23.3% sub-four inch crabs harvested during the 1998, 1997 and 1996 seasons, respectively.

Exvessel price for snow crabs harvested during the 1999 fishery ranged from \$0.85 per pound on the fishing grounds to a high of \$1.05 per pound at shore-side processors in Dutch Harbor at the season's end. Based on an estimated overall exvessel price of \$0.88 per pound, the 1999 snow crab fishery value is \$160.8 million (Table 5-24).

Weather conditions in the Bering Sea were unfavorable for much of the 1999 snow crab fishery. A storm late in January resulted in the loss of two crewmembers from two different vessels and the sinking of a third vessel. A severe storm during the final week of the fishery resulted in the loss of a second vessel and the death of all five crewmembers.

Sea ice did not present a major hindrance to the fishery in 1999. Ice remained 40-50 miles north of the Pribilof Islands until the final two weeks of the fishery when it reached the north end of Saint Paul Island. Due to relatively ice free conditions, some vessels were able to fish as far west as 177° 30' W long. and as far north as 60° N latitude. However, most fishing effort was concentrated east of 175° W long. and south of 58° N latitude.

Status of stocks

Data from the 1998 NMFS Eastern Bering Sea Trawl Survey indicated estimated total abundance of large males (≥ 102 mm CW) at 255 million crabs, a 17% decrease from the number of large male crabs estimated in the 1997 survey. Small male crabs (78-101 mm CW) decreased by 32% to an estimated 1,015 million crabs while large females crabs (> 50 mm CW) decreased by 16% to an estimated 1,161 million crabs. According to the 1998 survey, 83% of large male crabs were located east of the 173° W long., the boundary line between the Eastern and Western Subdistricts. In 1997, 91% of large male crabs were located east of 173° W longitude. Survey results indicate the population has peaked and will decline. This is supported by the increased prevalence of oldshell crabs in the 75-100 mm CW range (Stevens et al. 1998b).

BERING SEA GROOVED TANNER CRAB

Historic Background

The first reported landings of grooved Tanner crabs, *Chionoecetes tanneri*, from the Bering Sea occurred in 1988 after the BOF established a special permit season for deepwater Tanner crabs during their spring meeting. In 1993, the Alaska Department of Fish and Game (ADF&G) restricted the harvest to male crabs with carapace width of 5 inches or greater. Differential pot limits, based on vessel size, were applied to vessels fishing for deepwater Tanner crabs in the Bering Sea in 1994.

To obtain biological information on grooved Tanner crabs, the ADF&G implemented 100% onboard observer coverage in 1994, as allowed by the permit provisions in 5 AAC 35.082 (5 AAC 35.511, October 1996). Effort and landings decreased when Tanner crab pot limits for the

Bering Sea were applied to vessels fishing for deepwater Tanner crabs. At the March 1995 meeting, the BOF determined that pot limits should not apply to the deepwater permit fisheries of the Westward Region. Effort increased significantly to a harvest of over one million pounds and the value of the fishery exceeded \$1.3 million in 1995.

In 1997, ADF&G set GHLS for grooved Tanner crabs that were based on prior harvest information. Historically, the Bering Sea, Alaska Peninsula, and Eastern Aleutians areas supported the largest catches of grooved Tanner crabs. A GHL of 200,000 pounds was established for each of these areas. A GHL of 100,000 pounds was established in the Kodiak and Western Aleutian regions to allow for exploratory fishing. Additionally, due to industry concerns about viability of undersized and female deepwater crabs released at sea, the ADF&G began to require a minimum of two escape rings per pot with a minimum inside ring diameter of 4.5 inches. There were no vessels registered to fish grooved Tanner crabs in the Bering Sea District in 1997 or 1998 (Table 5-28).

1999 Fishery

No vessels registered to fish grooved Tanner crabs in the Bering Sea District in 1999.

Stock Status

There are no population estimates for Bering Sea grooved Tanner crabs. Limited information has been collected by onboard observers required on all vessels participating under the terms of the permit required for this and other deepwater crab fisheries. The information collected will be used to help develop management plans needed for this deepwater species.

BERING SEA TRIANGLE TANNER CRAB

Historic Background

Historically, triangle Tanner crabs, *Chionoecetes angulatus*, were taken as incidental bycatch in the grooved Tanner crab fishery. Vessel operators have verbally reported retention of triangle Tanner crabs before 1994. In 1994, a single incidence of triangle Tanner crab bycatch was documented by onboard observers. Prior to 1995, there had been no documented commercial harvest of this species. In 1995, triangle Tanner crabs were the target species of two deliveries. In 1996, less than three vessels delivered triangle Tanner crabs as bycatch. No vessels registered to fish triangle Tanner crabs in the Bering Sea District in 1997 or in 1998 (Table 5-29).

1999 Fishery

No vessels registered to fish triangle Tanner crab in 1999 in the Bering Sea District.

Stock Status

There are no population estimates for Bering Sea triangle Tanner crabs. Limited information has been collected by onboard observers required on all vessels participating under the terms of the permit required for this and other deepwater crab fisheries. The information collected will be used to help develop management plans needed for this deepwater species.

LITERATURE CITED

- Stevens, B.G., R.S. Otto, J.A. Haaga, and R.A. MacIntosh. 1998a. Report to Industry on the 1997 Eastern Bering Sea Crab Survey. (Alaska Fisheries Science Center) Processed Report 98-02.
- Stevens, B.G., J.A. Haaga, and R.A. MacIntosh. 1998b. Report to Industry on the 1998 Eastern Bering Sea Crab Survey. (Alaska Fisheries Science Center) Processed Report 98-07.
- Stevens, B.G., J.A. Haaga, R.A. MacIntosh, and R.S. Otto. 2000. Report to Industry on the 1999 Eastern Bering Sea Crab Survey. (Alaska Fisheries Science Center) Processed Report 2000-01.

BERING SEA KOREAN HAIR CRAB

Description of Area

The Bering Sea hair crab registration district includes all waters north of 54° 36' N. lat., south of 60° N. lat., and east of the U.S.-Russian Convention Line of 1867 (Figure 5-13).

Historic Background

The fishery for Korean hair crab *Erimacrus isenbeckii* in the Bering Sea was pioneered by the Japanese fleet during the 1960s and first commercially exploited by the U. S. fleet in 1978. In the early years of the U. S. fishery, the Korean hair crab season was opened by emergency order concurrent with the Bering Sea Tanner crab fishery. However, by 1980 a year-long permit fishery had been established. Throughout the 1980s, harvest of Korean hair crabs occurred primarily as bycatch in the Bering Sea Tanner crab fisheries, but as interest in the fishery and market demand increased, ADF&G began to manage the fishery under conditions of a commissioner's permit. The commissioner's permit fishery was initiated in 1993 and permit terms described fishing conditions such as location, size and sex of legal animals and observer coverage (ADF&G 1996).

As a result of a steady increase in the number of vessels participating in this fishery, the Alaska Legislature passed **AS 16.43.901. VESSEL PERMITS** in 1996, authorizing the Commercial Fisheries Entry Commission to regulate vessel licenses in the Bering Sea Korean hair crab fishery. Vessel qualification for this moratorium was based on participation in at least one of the qualifying years (1992-1995). Licenses were issued to 23 vessels for those waters beyond 5 nautical miles of St. George and St. Paul Islands. Also included in this legislation were provisions which allow any vessel 58 feet and under to fish within 5 nautical miles of St. George and St. Paul Islands. While **AS 16.43.901. VESSEL PERMITS** specifically requires 100% observer coverage on all vessels

participating in the Bering Sea hair crab fishery, the ADF&G exempted vessels under 44 feet in length from mandatory observer coverage for observer safety considerations (ADF&G 1998).

Participation and harvest have varied greatly over the history of the U. S. Bering Sea Korean hair crab fishery. Effort and harvest reached a peak of 67 vessels and 2.4 million pounds in 1980 when the fishery was prosecuted as a bycatch fishery during the Tanner crab season. Between 1987 and 1990 effort was minimal due to low stock abundance. Since the moratorium, effort has remained at 21 or fewer vessels and in 1997 only 16 vessels made landings. In the 1990s, harvest reached a peak of 2.3 million pounds in 1994 (Table 5-30, Figure 5-14). The fishery reached a peak exvessel value of \$5.7 million in 1995 (Table 5-31). Since 1995, both effort and GHL have declined.

Beginning in 1993, the Korean hair crab fishing season opening date was set at November 1 which conflicted with the Bristol Bay red king crab fishery. In 1998, ADF&G solicited comments from industry regarding a new opening date. A consensus was reached that the fishery would open 10 days after the closure of the Pribilof District or St. Matthew Island section king crab fisheries, whichever closed later, thereby allowing vessels to fish for both hair crab and Bristol Bay red king crab. The fishery opened on October 8 in 1998. In 1999, the BOF changed the Bristol Bay red king crab season opening to October 15, thus the Korean hair crab fishery was again in conflict. Consensus was reached with industry to conduct the fishery 10 days after the closure of the Bristol Bay red king crab fishery.

1999 Fishery

The 1999 Bering Sea Korean hair crab fishery opened by commissioner's permit at 12:00 noon, October 30, 1999 with a GHL of 283,000 pounds. The GHL was established using results of the National Marine Fisheries Service Bering Sea trawl survey. This survey yielded a total population estimate for large ($>3.25''$), male Korean hair crab of 2.3 million crabs, a 22% decline from the 1998 abundance level; 0.8 million of these crabs were observed in the vicinity of the Pribilof Islands (Stevens et al. 2000). Assuming a 1.76 pound average weight per crab, the biomass of large, male Korean hair crab in the vicinity of the Pribilofs was estimated to be 1.42 million pounds. Because confidence in the results of this survey is relatively low, a 20% fishery exploitation rate was used to determine the GHL for this fishery. Interestingly, 65% of the large male Korean hair crab population in the Bering Sea was found in the Northern District, whereas historically, most are found in the Pribilof District.

Eight vessels registered for the 1999 fishery, which is a 38% decrease from the 1998 vessel registry of 13, and a 50% decrease in effort from the 1997 season. All vessels registered in 1999 were greater than 58' in length and thus were required to carry an observer during all fishing activities and fish exclusively outside of five miles. Observers reported catch, effort and bycatch data to ADF&G in Dutch Harbor three times per week.

The 1999 harvest was 221,656 pounds, a 28% reduction from the 1998 harvest of 307,739 pounds. The fleet averaged approximately 2,661 pot pulls per day, a substantial decrease from the 1998 effort level of 10,000 pot pulls per day. Initial catch per unit of effort (CPUE) was 2.0 legal crabs per pot lift, but then declined to 1.5. CPUE fluctuated between 1.0 and 1.7 legal crabs per pot lift until November 22 when it dipped below 1.0 where it remained until the fishery closure. As fishery performance declined over the course of the fishery, so did effort. By November 17, only two

vessels continued to fish and all fishing activity ceased by December 1. The fleet harvested approximately 6,687 pounds per day, a substantial decrease from the 1998 average daily catch of 23,000 pounds. Average catch per vessel was 27,500 pounds which is unchanged from the 1998 average. Ninety nine percent of the 1999 harvest was taken from two statistical areas (Table 5-32).

The average weight of hair crabs caught during the 1999 fishery was 1.6 pounds and ranged from 1.4 to 1.7 pounds. These figures are consistent with the 1998 and 1997 average weight of 1.5 and 1.6 pounds respectively, but are well below the historic high average weight of 2.2 pounds per crab observed in the 1980/81 fishery.

In previous seasons, the practice of discarding legal hair crabs at sea due to product quality considerations has been a concern in the hair crab fishery. In addition, the Korean hair crab fishery is typically prosecuted after the closure of the Pribilof District king crab fishery and bycatch of red and blue king crabs in hair crab pots is a concern. In 1999, observers reported that approximately 15,500 pounds of legal hair crabs were discarded at sea, which compares favorably to the 28,000 pounds discarded in 1998. Bycatch of red and blue king crabs was reduced from 9,000 king crabs in 1998 to 1,425 king crabs, or 10 king crabs per 1,000 legal hair crabs in 1999.

Korean hair crabs were sold in both Dutch Harbor and Saint Paul. Prices per pound ranged from \$4.00 for #1 grade crab to \$3.00 for #2 grade, and \$1.00 for #3 grade. These prices were offered for processors shipping a whole, cooked, frozen product. In previous seasons, a portion of the catch was shipped as a live product, however no live crabs were shipped in 1999. Processors reported that approximately 80% of hair crabs purchased were graded as #1, barnacle-free crab. Average exvessel price was \$3.20 per pound, yielding a total fishery exvessel value of approximately \$694,000.

Fishery Management and Status of Stocks

The Bering Sea Korean hair crab fishery is managed using data collected from observers, vessel operators and processors. Observers provide catch and effort reports that are expanded into harvest estimates at least three times per week and are the primary in-season management tool. Catch reports from processors are used to verify estimates generated from observer data. Reports from fishers provide information regarding distribution of crabs, gear conflicts, weather and other fishing conditions.

The 1999 NMFS trawl survey of the eastern Bering Sea indicated that the Korean hair crab population continues to decline. The abundance index for large male Korean hair crabs declined from 1981 to 1992 and increased from 1992 to 1996. Current survey results indicate that the large cohort first observed in 1989-1990 can no longer sustain large harvests. The 1999 abundance index of large male crabs was 22% lower than in 1998. Despite declines in male numbers, the abundance index of females increased 39% from the prior survey, however the confidence in the estimate of female abundance is poor (Stevens et al. 2000). Inferences made from female abundance data should be viewed with caution; the eastern Bering Sea trawl survey has never estimated the abundance of female and small male hair crabs with precision. In general, the biology and habitat usage of hair crabs makes them difficult to survey with trawl gear. Sixty-five percent of males and 88% of females were new hardshell crabs.

Population trends observed during the last three annual abundance surveys do not indicate that any increase in hair crab abundance is likely to be detected in 2000. Given this information and poor performance of recent fisheries, ADF&G will be developing a management policy which may include a minimum stock size threshold or minimum GHLL which must be met in order for a fishery to occur. This policy will be developed prior to the 2000 fishery.

LITERATURE CITED

- Alaska Department of Fish and Game (ADF&G). 1998. Annual management report for the shellfish fisheries of the Westward Region, 1997. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K98-39, Kodiak.
- Alaska Department of Fish and Game (ADF&G). 1996. Annual management report for the shellfish fisheries of the Westward Region, 1994. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Informational Report 4K96-37, Kodiak.
- Stevens, B. G., R. S. Otto, and R. A. MacIntosh. 2000. Report to the industry on the 1999 Eastern Bering Sea crab survey. Alaska Fisheries Science Center, AFSC Processed Report 2000-01. 59p.

MISCELLANEOUS SHELLFISH SPECIES

Bering Sea

Description of Area

The Bering Sea District of Registration Area J, as described for Miscellaneous Shellfish, includes all waters of the Bering Sea north of the latitude of Cape Sarichef at 54°36' N lat. and east of the U.S.-Russian Convention Line of 1867 (Figure 5-15).

Introduction

Miscellaneous shellfish species include hair crabs, sea urchins, sea cucumbers, snails, octopus and *Paralomis multispina*, a deepwater crab closely related to king crabs. These species have been harvested in relatively small amounts compared to the commercial king and Tanner crab fisheries which occur in the Bering Sea. Prior to 1999, it was Alaska Department of Fish and Game (ADF&G) policy to allow commercial fishing for miscellaneous shellfish species under authority of a commissioner's permit described in 5 AAC 38.062. PERMITS FOR OCTOPI, SQUID, KOREAN HAIR CRAB, SEA URCHINS, SEA CUCUMBERS, SEA SNAILS, CORAL, AND OTHER MARINE INVERTEBRATES. Typically, permit conditions were general and not fully developed on an individual species basis. Fisheries for miscellaneous shellfish species occurred without prior knowledge of stock abundance or distribution and no harvest limits were established. To better regulate these types of fisheries, the ADF&G is developing a plan for new and developing fisheries. Prior to the adoption of this plan, the ADF&G will only register vessels for those fisheries which have an established guideline harvest level (GHL).

Those species of current or historic interest in the Bering Sea include octopus, *Paralomis multispina*, Dungeness crabs, and snails. North Peninsula shrimp do not fall under the miscellaneous species category but are included in this report due to low or infrequent annual harvests. The fisheries for shrimp and Korean hair crabs in the Bering Sea District are described in separate reports.

Bering Sea Octopus

There were no directed octopus landings from the Bering Sea in 1999, however 25 vessels landed 6,694 lbs. of octopus as incidental bycatch in the various groundfish fisheries in state and federal waters of the Bering Sea (Table 5-33). There were no directed octopus landings reported from the Bering Sea in 1998, however 4,324 lbs. were landed as bycatch in groundfish fisheries in state and federal waters. In 1997 and in 1996, all reported harvest was from incidental bycatch as compared to 1995 when octopus was a targeted species.

Paralomis Multispina

No vessels registered or fished for *P. multispina* in the Bering Sea District during the 1997 through 1999 seasons (Table 5-33). One vessel, for which landings are confidential, participated in the 1996 fishery. Although one vessel was registered for *P. multispina* in 1995, no commercial harvest was reported.

Snails

Historic Background. Commercial fishing for snails in the Bering Sea began with the Japanese in 1971 and continued until 1987, however little information is available from this early fishery. In 1977, the Japanese began providing records to the United States concerning fisheries occurring inside the U.S. Exclusive Economic Zone (EEZ), as mandated by the Fishery Conservation and Management Act of 1976 (MacIntosh 1979). The National Marine Fisheries Service (NMFS) recorded 14 vessels participating in 1971, five vessels in 1972, no vessels in 1973, and six vessels in 1974. There was no fishing activity in 1975 and 1976. In 1977, records indicate that participation in the fishery increased to three vessels (MacIntosh 1980). In the 1980s all fishing was conducted by catcher-processor vessels. The majority of the retained catch during this early fishery was composed of the Pribilof Neptune snail *Neptunea pribiloffensis*. Smaller components of the retained catch were composed of *Buccinum angulosum* and *B. scalariforme* (MacIntosh 1980). Exvessel value was \$242 thousand in 1977, increasing to \$1.3 million by 1979. Russian vessels began fishing for snails in the same area in 1989.

The Foreign Fisheries Observer Program assigned observers to Japanese catcher-processors in the years 1984-1987 and later to Russian vessels in 1989. The Russian venture only lasted one year with minimal return. Gear used during the early foreign fishery was converted Tanner crab pots. Pots were longlined in depths from 100 to 150 fathoms. Data from the Foreign Fisheries Observer Program showed the Japanese fleet pulled an average of 2,779 pots per day with an average soak time of 50 hours while the Russian vessels averaged just 1,219 pot lifts per day with an average soak time of 80 hours.

The U.S. fishery began in 1992 when two vessels registered to fish for snails. One vessel harvested snails as bycatch in the Tanner crab *Chionoecetes bairdi* fishery and the second

participated in a directed fishery for snails after the June closure of the hair crab *Erimacrus isenbeckii* fishery. Fishing for snails was limited to waters of the Bering Sea District west of 168° W long. from 1994 to 1996. In 1997, snail fishing was limited to waters west of 164° W longitude.

Observer coverage was required in 1993 under 5 AAC 39.210 (h) MANAGEMENT PLAN FOR HIGH IMPACT EMERGING FISHERIES. Minimal crab bycatch was observed in the area west of 168 W long. Bycatch of legal-sized blue king crab *Paralithodes platypus* and red king crab *Paralithodes camtschaticus* was less than 0.1 animals per pot. Female snow crabs *Chionoecetes opilio* had the highest incidence of bycatch at 0.9 animals per pot (Tracy 1995).

Observer coverage was not required again until 1997 when two vessel operators expressed interest in fishing east of 168° W longitude. Vessels were restricted to grounds west of 164° W long. and north of 54° 36' N latitude. These restrictions were conditions of the permit issued under 5 AAC 38.062 PERMITS FOR OCTOPI, SQUID, KOREAN HAIR CRAB, SEA URCHINS, SEA CUCUMBERS, SEA SNAILS, CORAL, AND OTHER MARINE INVERTEBRATES. There was no bycatch of red or blue king crabs, however bycatch of Tanner crabs was observed. An estimated 17,300 female and 2,106 sublegal male Tanner crabs, in addition to 57,568 sublegal snow crabs, were captured in the 191,893 pots pulled.

In the 1997 fishery, average catch per unit of effort (CPUE) was 16 snails per pot, equal to the CPUE from vessels fishing northwest of the Pribilof Islands in the 1996 fishery. The majority of the catch for the 1997 season was composed of the genera *Neptunea* and *Buccinum*. Catches increased from 312,876 lbs. in 1993 to 3,572,992 lbs. in 1996 and then declined to 932,048 lbs. in 1997 (Table 5-34 & Figure 5-16). The value of the fishery increased from \$125 thousand in 1993 to over \$1.0 million in 1996 and then dropped to \$308 thousand in 1997 (Table 5-35).

1999 Fishery. No vessels registered to harvest snails from the Bering Sea in 1999.

Stock Status. The NMFS Eastern Bering Sea Trawl Survey provides distribution and relative abundance information on Bering Sea snail populations. However, differential catchability of various species of snails makes accurate population estimates difficult.

North Peninsula

Description of Area

The North Peninsula District for shrimp management includes all waters of the Bering Sea east of the longitude of Cape Sarichef at 164°55'30" W long. (Figure 5-17). The North Peninsula District for management of Dungeness crabs *Cancer magister* includes Bering Sea waters of Registration Area J that are north of the latitude of Cape Sarichef at 54° 36' N lat. (Figure 5-18).

Shrimp

No vessels have registered for the North Peninsula District pot or trawl shrimp fishery since 1994. No information exists on the status of shrimp stock in the North Peninsula District.

Dungeness Crabs

No vessels registered to fish for Dungeness crabs in the North Peninsula District in 1999. Catch information from 1996 to 1998 is confidential, as less than three vessels participated in those years. The average annual harvest in the three year period from 1996-1998 was approximately 48,000 pounds. In 1995, a total of six vessels made 19 deliveries for a harvest of 134,406 pounds (Table 5-36).

LITERATURE CITED

- MacIntosh, R. 1980. The snail resource of the eastern Bering Sea and its fishery. *Marine Fisheries Review*. 42:15-20.
- MacIntosh, R. 1979. Alaska's snail resource. *Alaska Seas and Coasts*. Vol. 6. No. 5.
- Tracy, Donn. 1995. Alaska Department of Fish and Game biological summary of the 1993 mandatory shellfish observer program database. Alaska Department of Fish and Game, Commercial Fisheries Management and Development, Regional Information Report No. 4K95-14, Kodiak.

1999 BERING SEA COMMUNITY DEVELOPMENT QUOTA CRAB FISHERIES

Description of Area

The Bering Sea, for Community Development Quota (CDQ) fisheries, encompasses all waters north of Cape Sarichef (54°36' North latitude), south of Cape Prince of Wales (65°49' North latitude), and east of the U.S.-Russia Convention Line of 1867, including the waters of Bristol Bay. For those CDQ fisheries managed by the Alaska Department of Fish and Game (ADF&G) staff in Dutch Harbor, Cape Romanzof (61°49' North latitude) is the northern boundary (Figure 5-19).

Historic Background

The North Pacific Fishery Management Council (NPFMC) established the CDQ Program in 1992. In 1995 the council included Bering Sea crab in the CDQ Program. The Alaska Board of Fisheries (BOF) adopted regulations for the Bering Sea/Aleutian Islands king and Tanner crab CDQ fisheries in 1997, and those fisheries started in 1998. The State of Alaska manages the CDQ Program, and ADF&G manages the crab CDQ fisheries.

There are 65 coastal Bering Sea communities eligible for the CDQ Program. These communities are aligned into six CDQ organizations and are collectively referred to as CDQ groups. The groups are Aleutian Pribilof Island Community Development Association (APICDA), Bristol Bay Economic Development Corporation (BBEDC), Central Bering Sea Fishermen's Association (CBSFA), Coastal Villages Regional Fund (CVRF), Norton Sound Economic Development Corporation (NSEDC), and Yukon Delta Fisheries Development Association (YDFDA).

The CDQ groups are non-profit entities, which may have for-profit subsidiaries. Each group submits comprehensive plans on the intended use of the CDQ funds. These uses vary widely between groups, but most are fishing-related investments, scholarships, training, employment services and other projects which are intended to benefit the communities and regions the CDQ groups represent. The groups are buying equity in fishing vessels which will harvest crab in both CDQ and open access fisheries.

The CDQ groups have received allocations for 1998 through 2000 for the following Bering Sea crab fisheries: Norton Sound red king crab *Paralithodes camtschatica*, Bristol Bay red king crab, Pribilof red and blue king crab *P. platypus*, St Matthew blue king crab, Bering Sea snow crab *Chionoecetes opilio*, and Bering Sea Tanner crab *C. bairdi* (Figure 5-19). To be eligible as CDQ crab fisheries, the stocks must have a regularly assessed guideline harvest level (GHL) and be managed under the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (FMP). The CDQ allocation is based on the total harvest of each Bering Sea FMP crab species. The annual CDQ percentages for crab are phased in over a three-year period (3.5% of the total fishery harvest for 1998, 5.0% for 1999, and 7.5% for 2000). The individual CDQ group allocation percentage varies in each fishery (Table 5-37). This report addresses all of the above fisheries except the Norton Sound red king crab fishery.

The CDQ groups are required to submit fishery plans to the department prior to each fishery. Plans included names of participating vessels and operators, vessel information regarding safety and communications, intended processor and location, method of attaining but not exceeding the allocation, and if a cooperative effort, the method of dealing with deadloss and overages.

In 1998, the allocation was 3.5% of the total harvest of red king crab, blue king crab and snow crab. No Tanner crab fishery occurred in 1998 due to low stock abundance. Crab CDQ fisheries started during the spring of 1998. All six CDQ groups participated in those fisheries during the year, however, not all groups participated in each fishery.

All 1998 CDQ crab fisheries were after the open access fisheries, and all CDQ vessels participated in the open access fishery. Before vessels were allowed to register for the CDQ fishery, the offload of crab harvested in the open access fishery had to be complete. They were required to obtain an onboard observer and buoy tags for all gear to be fished. Additionally, all gear had to be in compliance with the closure requirements of the open access fishery. At the time of registration all gear onboard the vessel had to be tagged with CDQ pot tags; all gear in the water had to be CDQ tagged before being deployed in the fishery.

The 1998 CDQ snow crab fishery started March 29 and ended May 28. Twenty vessels made 86 deliveries for a total harvest of 8.85 million pounds (Table 5-38). The catch per unit of effort (CPUE), defined as catch per pot pull, was 174 crabs. This CPUE was less than the 207 crabs per pot in the open access fishery. The average weight was 1.3 pounds, approximately the same as the open access fishery. The exvessel average price per pound was \$0.54 (Table 5-39), slightly less than the \$0.56 per pound in the open access fishery. Total CDQ fishery value was \$4.7 million. All six CDQ groups participated in this fishery.

The St. Matthew Island Section CDQ blue king crab fishery in 1998 started September 29; all fishing activity was concluded by October 12. Two vessels made four deliveries for a total harvest of 98,918 pounds. The CPUE was ten crabs compared to the seven crabs per pot pull in

the open access fishery. The average weight of crabs in the CDQ fishery was 4.3 pounds, less than the 4.7 pounds per crab in the open access fishery. The average price per pound was \$1.67, down from the \$1.87 per pound in the open access fishery. Total CDQ fishery value was \$164 thousand. Five CDQ groups participated in the fishery; the CBSFA did not.

The 1998 Pribilof CDQ red and blue king crab fishery started on November 13; all fishing activity was completed by November 26. One vessel harvested 33,973 pounds of red king crab and 1,730 pounds of blue king crab. The overall CPUE was six crabs in the CDQ fishery, the same as in the open access fishery. The average weight of red king crab was 10.0 pounds in the CDQ fishery, significantly larger than the 7.5 pounds per crab in the open access fishery. Blue king crab averaged 7.8 and 7.5 in the CDQ and open access fisheries, respectively. The average exvessel price per pound for the CDQ fishery was \$2.90, well above the open access average price of \$2.37. Total CDQ fishery value was \$96 thousand. Only the CBSFA participated in the fishery.

The Bristol Bay CDQ red king crab fishery in 1998 started November 9 and all fishing activity was completed by November 23. Seven vessels made 15 deliveries for a harvest of 524,338 pounds. The CPUE in the CDQ fishery was 23 crabs, well above the 15 crabs per pot pull in the open access fishery. Average weight of crabs was 7.0 pounds in the CDQ fishery, compared to 6.8 pounds in the open access fishery. The average price per pound for the CDQ fishery was \$2.45, well below the average of \$2.60 per pound for the open access fishery. Total CDQ fishery value was \$1.3 million. Five CDQ groups participated in the fishery, while the CBSFA did not.

During 1998, a total of 20 vessels harvested 9.5 million pounds of Bering Sea red king crab, blue king crab, and snow crab for an exvessel fishery value of \$6.2 million with an average price of \$0.67 per pound. Four shorebased processing plants, two shorebased live crab shippers, and one floater-processor operated during the CDQ fisheries.

During the inaugural season, onboard observers were required during all fishing operations. Observers documented fishing practices and collected biological data during periods outside of the normal fishery seasons. Additionally, the onboard observers provided data in fisheries where at-sea sampling has been minimal. Data obtained from observers deployed during CDQ king crab fisheries indicated no significant difference in fishing strategy as compared to the open access fishery. The minimum legal size for snow crab by regulation is 3.1 inches; industry preferred minimum size is 4.0 inches. A high discard rate of crabs over four inches was observed during the CDQ snow crab fishery. This indicated a possible change in fishing strategy. Data to be obtained from observers and vessel logbooks during the 1999 snow crab fishery should clarify this situation.

The regulations pertaining to the CDQ fisheries (5AAC 39.690) allow for a harvest prior to the open access fishery. With the implementation of the program in 1998, the department decided not to allow for a CDQ harvest before the open access fishery. The department wanted a full understanding of the impact of these new fisheries and to have adequate staff to handle the increased management burden before allowing CDQ fisheries to occur prior to the open access fisheries.

The ADF&G intended to allow CDQ groups to harvest part of their allocation before the open access fishery during the second and subsequent years of the program. This would have allowed

CDQ groups to harvest part of their 1999 allocation of snow crab in the fall of 1998. In October of 1998 the National Marine Fisheries Service (NMFS) determined that their CDQ crab regulation language did not allow for a harvest of the allocation outside of the calendar year to which it was assigned. The intent of NMFS was not to impede ADF&G management of the CDQ crab fisheries. The NMFS proceeded to revise the federal CDQ regulations, however this could not be done in time for a harvest of snow crab to occur in the fall of 1998.

1999 Crab CDQ Fisheries

The CDQ allocation for 1999 was 5.0% of the total harvest of Bristol Bay red king crab and Bering Sea snow crab. The CDQ groups continued to submit fishery plans to the department prior to each fishery. All CDQ vessels participated in the open access fishery, and all permit and registration requirements previously stated were still in effect.

In 1999 the observer coverage was reduced in the CDQ snow crab fishery from one observer per vessel to one per CDQ group. This level of coverage was based on the number of vessels in the 1998 fishery and was considered adequate to obtain biological sampling goals set forth by the department. A goal was established for the observer to make at least one trip on each vessel during the fishery. Observer coverage remained at one observer per vessel for the Bristol Bay red king crab fishery. This level of coverage was due to the anticipated short duration of the fishery, therefore the inability for observers to make at least one trip on each vessel during the fishery. The observers continued to document fishing practices of the CDQ fleet.

The BOF agreed to address an agenda change request at the March 1999 board meeting. The request was to prohibit any CDQ harvest prior to the open access fishery. Representatives of processors and non-CDQ fishers contended that CDQ crab on the market prior to the open access fishery would be detrimental to value of the latter fishery. The board directed the CDQ, non-CDQ and processor representatives to reach a compromise, and put the results into regulation. The new regulations allow a CDQ king or Tanner crab fishery prior to the open access fishery only when the GHL is 50 million pounds or more, and a maximum of 30% of the CDQ allocation may be harvested.

1999 Bering Sea CDQ Snow Crab Fishery

The Bering Sea CDQ snow crab fishery was conducted subsequent to the open access fishery. Six CDQ groups participated in this fishery and were allocated 9.67 million pounds. The amount allocated to each group varied, ranging from 10 to 19% (Table 5-37).

All vessels in the CDQ fishery also participated in the open access fishery, which closed on March 22. The vessels were required to offload all crab caught in the open access fishery, purchase new pot tags and to obtain an observer, if required, prior to registration and the commencement of any CDQ fishing.

Fishing effort commenced in late March. Deliveries started the first week of April, peaked during the weeks ending April 24 and May 1, and were completed by the end of May (Figure 5-20). Weekly delivered harvest ranged from 99 thousand pounds in early April to 2.3 million pounds for

the week ending April 24. Effort was primarily concentrated around the Pribilof Islands, with the area just west of St. Paul Island producing a major portion of the harvest (Figure 5-21).

Analysis of fish ticket data show that 23 vessels made 104 deliveries for a total harvest of 9.67 million pounds (Table 5-38). The participating vessels harvested 99.96% of the overall CDQ allocation.

Observer data show the CPUE ranged from 103 crabs during the first week of the fishery to 172 crabs in the fifth week. Fish ticket data show the CPUE was 165 crabs for the 1999 CDQ fishery. The open access fishery catch per pot pull was 158 crabs. The higher CPUE in the CDQ fishery, even though it occurred after the open access fishery, may be attributed to longer soak times. Average soak time, from onboard observer data, was 65 hours in the CDQ fishery compared to 48 hours in the open access fishery.

The average weight of retained crabs in the CDQ fishery was 1.2 pounds, down slightly from the 1998 CDQ fishery average weight of 1.3 pounds. The average weight for retained crabs in the 1999 open access fishery was 1.3 pounds. The average harvest per vessel in the CDQ fishery was 420 thousand pounds; this compares to 766 thousand pounds for vessels in the open access fishery.

Average exvessel price per pound was \$0.85, which produced a total fishery value of \$8.1 million (Table 5-39). For comparison, the 1998 CDQ fishery average price per pound was \$0.54 and the fishery value was \$4.7 million. The 1999 open access fishery value was \$160.8 million with an average exvessel price per pound of \$0.88.

Three shorebased processors participated in this fishery; two were in St. Paul and one was in Akutan. One floating processor operated in the Pribilof Islands during the fishery. This processor participation was the same as in 1998.

The reduction in observer coverage was well received by the CDQ groups, vessel owners and operators; to the department and those involved with scheduling operations the reduction had mixed results. The goal for the observer to make at least one trip on each vessel during the fishery was not met. Three of the twenty-three vessels in the fishery did not have an observed trip. Two of the CDQ groups, CBSFA and CVRF increased their number of vessels from 1998 levels; CBSFA had two vessels that operated in the fishery without having an observed trip. For the initial observer deployment the department obtained start dates for all vessels from group contacts and vessel operators. The actual start date of vessels in the fishery was delayed by as much as 16 days. One vessel fishing for YDFDA started two days early while the vessel with the observer entered the fishery eight days late, this resulted in one vessel without an observed trip.

Possible high grading of crabs was reported during the fishery. The industry standard for this fishery is four-inch crab. Bycatch information included on observer weekly radio reports indicated excessive numbers of four inch and larger crab were discarded by some vessels. The observer bycatch data was scrutinized during the debriefing process and the radio reports were found to be in error. The bycatch information relayed through those radio reports was for all legal but not retained crabs, which also included sub-four inch legal crabs.

Two vessels transferred their observer while at sea, in direct violation of their permit conditions. The observer was involved with the decision to make the transfer; therefore no legal action was taken against the vessel operators. One group exceeded their allocation by approximately 2,500 pounds.

1999 St. Matthew CDQ Blue King Crab Fishery

No commercial harvest of St. Matthew blue king crab, CDQ or open access, occurred in the Bering Sea during 1999 due to low stock abundance.

1999 Pribilof CDQ Red and Blue King Crab Fishery

No commercial harvest of Pribilof red or blue king crab, CDQ or open access, occurred in the Bering Sea during 1999 due to low stock abundance.

1999 Bristol Bay CDQ Red King Crab Fishery

The 1999 Bristol Bay CDQ red king crab fishery occurred subsequent to the open access fishery. The allocation for this fishery, based on harvest data obtained from inseason processor reports, was 580,641 pounds. The first vessels registered on October 23 and all vessels entered the fishery by October 27. Ten vessels fished for the five CDQ groups eligible to participate; those vessels made 12 deliveries for a harvest of 579,258 pounds (Table 5-38), or 99.8% of the total allocation. CBSFA was the only group not to participate in this fishery (Table 5-37).

Permits were issued to each CDQ group on October 20 at the close of the open access fishery. The permit stated the percentage of the CDQ allocation the group may harvest; that percentage is set forth for each CDQ group by fishery in federal regulations. The permit listed the vessel(s) requested by the group and authorized by the department to participate in the fishery. The permit also stated that those vessels must comply with requirements such as dates of operation, pot limits, buoy tags, observer coverage, etc. Vessel registration and permitting began on October 23, 72 hours after the open access closure. The 72-hour period between closure of the open access season and vessel registration, combined with travel time to the fishing grounds and soak time, provided a five to six day period before a CDQ vessel could effectively harvest crab. This period was designed to allow the department sufficient time to obtain and announce the final allocation. An addendum to each group permit was issued on October 26 specifying the final allocation. At that time, all vessels at-sea and the participating processors were notified of the final allocations.

The first three vessels registered on October 23, started retrieving gear on October 25 and were finished on October 27. Three vessels registered October 24, two on October 25 and the last two vessels registered on October 27. Most CDQ fishing operations were completed by November 3; however, mechanical problems and weather delayed the final trip of one vessel. All CDQ operations were finished on November 7.

Daily harvest ranged from just over 1,400 pounds on October 25, the first day of gear retrieval, to over 118,000 pounds on October 29 (Figure 5-22). Daily vessel participation ranged from two at

the start of the fishery, to a maximum of six on October 27 and 30, and one vessel at the end of the fishery. There were eleven days of fishing activity between October 25 and November 7. The CDQ vessels operated primarily north of Amak Island, in an area where large harvests of red king crab were anecdotally reported by fishers in the open access fishery (Figure 5-23).

Average weight of crabs in the 1999 CDQ fishery was over 6.7 pounds, below the average weight of 7.0 pounds observed in the 1998 fishery. Average weight in the 1999 open access fishery was 6.1 pounds per crab. The CDQ vessels operated in an area where larger crabs were harvested in the open access fishery.

The catch per pot pull varied from under 3 to over 40, and averaged 29 crabs. The CPUE in the 1998 CDQ fishery was 23 crabs. In the 1999 open access fishery, the CPUE was 12 crabs. The higher CPUE in the CDQ fishery was probably due to fishing location and to longer average soak time. The average soak time, obtained from observer data, for the CDQ fishery was 36 hours compared to 25 hours for the open access fishery.

The average exvessel price per pound for the CDQ fishery was \$5.88 (Table 5-39), below the open access average price of \$6.25, but well above the \$2.45 paid in 1998. The total fishery value was approximately \$3.4 million, which compares to \$1.3 million in 1998.

CDQ vessels fished for an average of 3.8 days, approximately 25% less than in the open access fishery. Two of the groups used one vessel each to harvest their allocation; both of those vessels fished for six days. This compares to just over five days in the open access fishery. CDQ vessels averaged 57,926 pounds, appreciably exceeding the average of 42,778 pounds per vessel in the open access participants.

There was 100% observer coverage for the Bristol Bay red king crab CDQ fishery. Observers collected biological data and provided inseason harvest rates to the department. Observers also documented fishing practices of the CDQ fleet.

The CDQ fishery progressed smoothly, and no allocations were exceeded. There were no observer reports of extensive high grading by vessel crews. The 72-hour period between the open access fishery and the CDQ fishery delayed fishing plans of only three vessels. They were three of the four vessels fishing for APICDA. The 72-hour period was sufficient this year to allow the department to obtain the open access harvest and establish CDQ harvest levels. However, with a smaller allocation, more vessels per group or delayed reporting from the open access fishery, a 96-hour period may be appropriate.

1999 Bering Sea CDQ Tanner Crab Fishery

No commercial harvest of Tanner crab, CDQ or open access, occurred in the Bering Sea during 1999 due to low stock abundance.

Summary

Six CDQ groups participated in the Bering Sea snow crab fishery in 1999. Five CDQ groups participated in the Bristol Bay red king crab fishery. A total of 25 vessels harvested 10.25 million pounds of red king crab and snow crab for an exvessel fishery value of \$11.5 million with an average price of \$1.14 per pound (Table 5-39). Four shorebased processing plants and one floater-processor operated during the CDQ fisheries. The 1999 CDQ crab fisheries were after the open access fisheries.

Data obtained from observers deployed during CDQ king crab fisheries indicated no significant difference in fishing strategy as compared to the open access fishery. A high discard rate of crabs over four inches was observed during the CDQ snow crab fishery. Data collected by observers and dockside samplers in the open access fishery and by observers in the CDQ fishery show no significant difference in average carapace width of harvested snow crab. The average width was 110.3mm in the open access fishery compared to 110.6mm in the CDQ fishery. Fish ticket data show no significant difference in average weight, 1.29 pounds in the open access fishery and 1.25 pounds in the CDQ fishery. Observer debriefings and analysis of logbook data from unobserved effort show that the discard of four-inch and larger crab in the CDQ fishery is primarily due to the high occurrence of epibionts. This fishery follows the open access fishery during which large portions of the marketable crabs have already been harvested.

BERING SEA KING AND TANNER CRAB BUOY IDENTIFICATION TAGS

Introduction and Background

The Bering Sea and Aleutian Islands crab fisheries in the early 1990s were characterized by increased fishing effort, decreased guideline harvest levels (GHL) and shorter fishery seasons. Preliminary data from the Alaska Department of Fish and Game (ADF&G) indicated high levels of pot gear in the Bering Sea fisheries created difficulties in conservation and management of crab resources. In 1991, the Alaska Board of Fisheries (BOF) requested an agenda change to discuss gear limitations for the Bering Sea/Aleutian Islands king and Tanner crab fisheries. This action was in response to a petition submitted by industry. The BOF adopted regulations in 1992 that limited the number of pots a vessel could operate when harvesting Bering Sea king and Tanner crabs. New regulations became effective on August 1, 1992. Buoy tags are used to enforce these regulations. The program was designed to be self-supporting through buoy tag sales according to Alaska statute.

Buoy stickers were used in the 1992 Bristol Bay red king crab *Paralithodes camtschaticus* fishery. Buoy sticker requirements were temporarily suspended due to widespread sticker loss due to failure of sticker adhesive after extended exposure to water and weather. However, pot limits remained in effect for the Bering Sea Tanner crab, *Chionoecetes bairdi*, fishery. The National Marine Fisheries Service (NMFS) officially repealed the Bering Sea pot limits on November 30, 1992 due to inconsistency with the national standards, which required pot limits to be applied in a nondiscriminatory manner. The BOF passed differential pot limit regulations in February 1993, based on overall vessel length. These regulations specify that vessels in excess of 125 feet in

length overall are entitled to the maximum number of pots allowed for a fishery and vessels 125 feet and under in length overall are allowed 80% of the number allowed for the larger vessel size class. Each fishery has its own set of specific pot limit requirements (Table 5-40).

Implementation

The commissioner of ADF&G has the power to establish and charge fees equal to the cost of services provided in accordance with the provisions set out in AS 16.05.050 (16) POWERS AND DUTIES OF THE COMMISSIONER, and SEC 16.05.632 (a) (6) IDENTIFICATION OF SHELLFISH POTS OR BUOYS, OR BOTH, USED IN THE TAKING OF KING CRAB AND REQUIREMENTS FOR BUOYS. Tags for the identification of shellfish pots or buoys, or both, used in the taking of king and Tanner crabs are required in areas where the BOF has regulations limiting the total number of shellfish pots allowed per vessel. Tags shall be issued and renewed for a fee equal to the cost of obtaining the tags plus reasonable administrative costs, under procedures determined to be appropriate by the ADF&G.

Beginning with the 1992/1993 Bristol Bay king and Bering Sea Tanner crab seasons ADF&G leased additional office space in Dutch Harbor and employed a Fish and Wildlife Technician III to administer the buoy identification tag sales program. By May 1993, the decision was made to use heavy duty, self locking nylon tags, available in a variety of colors. These colors could be rotated through fisheries with an imposed pot limit. Each tag had a 1.5-inch by 4-inch flag printed with a unique number. After use in various fisheries, numerous quality control problems and industry complaints, ADF&G initiated trial tests of other manufactured tags. As a result of these tests, a new style buoy tag was procured. The new type tag measured 2.75 inches by 2 inches with a heavy duty 1.5-inch tail. Issuance of the new style tags, which are attached to the buoy by means of an independent attachment device (standard zip tie or twine, etc.), began in September 1998. ADF&G initially supplied zip ties for tag attachment at no additional charge. ADF&G discontinued supplying zip ties in early 1999, as the result of industry complaints of high failure rate of the ADF&G provided zip ties. Since that time, fishers have been required to provide their own means of tag attachment.

The BOF adopted new interim pot limit regulations for the Bristol Bay red king crab fisheries in August of 1997 which set out an eleven-tiered pot limit program based on the season's GHL and the number of participating vessels. Also adopted was a preseason registration requirement to determine the number of vessels planning to participate. Vessel operators must preregister approximately one month before the fishery opening. At the March 1999 BOF meeting these interim pot limits and vessel preregistration requirements were made permanent. These differential pot limits for the Bristol Bay registration area are set out in 5 AAC 34.825. LAWFUL GEAR FOR REGISTRATION AREA T (Table 5-40). Preseason registration requirements for the Bristol Bay king crab registration area are listed in 5 AAC 34.806. AREA T REGISTRATION.

Bering Sea buoy tags are issued from the ADF&G offices in Dutch and Kodiak. An administrative fee of \$2.00 per tag is charged. Tags are issued to the holder of a valid Commercial Fisheries Entry Commission interim use permit card for the specified fishery or to an authorized agent of the vessel. Uniquely numbered tag sets are assigned to vessels by ADF&G number. These two measures ensure only one set of tags are issued per vessel for each fishery.

When tags are issued, funds are received from the permit holder or the vessel's authorized agent. The ADF&G tag sales agent registers the sale and tag numbers into a vessel database program and deposits fees into a State of Alaska bank account.

Replacement Tags

The replacement of lost tags is permitted by 5 AAC 34.826. (b) KING CRAB POT MARKING REQUIREMENTS FOR REGISTRATION AREA T, 5 AAC 34.926. (b) KING CRAB POT MARKING REQUIREMENTS FOR REGISTRATION AREA Q, and 5 AAC 35.526. (b) TANNER CRAB POT MARKING REQUIREMENTS FOR REGISTRATION AREA J.

Replacement of lost identification tags is permitted if the vessel operator and three crew members, submit in person, to the ADF&G office in Dutch Harbor, a sworn statement or affidavit, describing how the tags were lost and listing the numbers of the lost tags. Official AFFIDAVIT TO OBTAIN REPLACEMENT BUOY IDENTIFICATION TAGS forms, reviewed and approved by the Division of Fish and Wildlife Protection (FWP), are available in the Dutch Harbor office.

The BOF considered not allowing replacement of lost buoy tags. However, the BOF determined that a tag program, which did not allow for replacement of lost tags, would be an unreasonable hardship to industry. The Division of Fish and Wildlife Protection (FWP) anticipated difficulty in prosecuting over-pot limit cases if replacement of tags was permitted, therefore, specific conditions regarding replacement tags were included in the regulations to address concerns of the FWP.

During the interim between the 1994 Bristol Bay red king crab and the Bering Sea Tanner crab fisheries, and prior to the 1995 snow crab *Chionoecetes opilio* season, numerous complaints were received in the Dutch Harbor office from fishers regarding problems associated with tag replacement. Under the existing regulations, vessels delivering to remote areas such as King Cove or St. Paul were unable to easily obtain replacement tags. Most vessel operators felt the cost in lost fishing time and the expense to transport themselves and three crew members to Dutch Harbor to fill out the required forms made tag replacement prohibitive. Some expressed feelings that the existing requirements would promote illegal fishing. In addition, many vessels were operated by relief skippers who inherited the task of determining which tags were missing before they could apply for replacements.

During the 1998 and 1999 seasons, stakeholders reiterated buoy tag replacement issues. These complaints were likely due to increased enforcement activity associated with deployment of a new enforcement vessel prior to the start of the 1998 fall king crab fisheries. In response, beginning with the 2000 Bering Sea snow crab fishery, permit holders will be allowed to file affidavits for replacement tags in St. Paul or King Cove if ADF&G personnel are available. These replacement affidavits will be verified by ADF&G staff and then faxed to the Dutch Harbor ADF&G office for processing. Once a valid affidavit has been submitted to the Dutch Harbor ADF&G office it is the responsibility of the permit holder to obtain the services of an agent to pay for, pick up and transport the tags to the vessel operator filing the affidavit.

Vessel Length Verification

All vessels in excess of 125 feet in length overall wishing to obtain the maximum number of buoy tags for crab fisheries with imposed pot limits must present an original or notarized copy of valid documentation from the U.S. Coast Guard or certified marine surveyor showing the vessel to be in excess of 125 feet overall. The vessel operator/permit holder of a vessel over 125 feet is required to show documentation of vessel length the first time buoy tags are purchased and any time a change to the vessel's overall length occurs. Overall length is defined in 5 AAC 34.825 (j) LAWFUL GEAR FOR REGISTRATION AREA T and 5 AAC 35.525 (f) LAWFUL GEAR FOR REGISTRATION AREA J as the horizontal distance, rounded to the nearest foot, between the foremost part of the stem and the aftermost part of the stern, excluding bowsprits, rudders, outboard motor brackets and similar fittings or attachments. This definition of length overall is also found in the U.S. Code of Federal Regulations, Shipping, 46 CFR 69.9 and Fishery Conservation and Management, 50 CFR 672.2. The Department's Dutch Harbor office has established a qualifying list of vessels whose length is documented in excess of 125 feet. A total of 120 vessels are presently on the Department's qualifying list.

Administration of the Buoy Identification Program

Buoy tags are sold from the ADF&G offices in Dutch Harbor and Kodiak. Upon request, the ADF&G will send buoy tags through the U.S. Mail, priority mail and insured with a return receipt from Dutch Harbor. Two weeks prior to each season, the department discontinues tag mailings because of potential logistical problems that can be caused by delayed mail service.

1999/2000 Tag Sales

Tag sales in the 1999/2000 Bering Sea crab fisheries were marked by the prosecution of only one of the major fisheries as scheduled, the cancellation of three others and a delayed start in the 2000 Bering Sea snow crab fishery. Due to stock declines of St. Matthew Island blue king crabs, the Pribilof Islands red and blue king crabs and Bering Sea Tanner crabs, each of these fisheries were cancelled. Tags were procured by the department for the Pribilof District and St. Matthew Island Section fisheries; however, no tags for these fisheries were sold. These tags remain in storage in Dutch Harbor.

Bristol Bay red king crab tag sales totaled 262 sets or 42,802 individual tags (Table 5-41). Of the total number of tag sets sold, 36 sets were sold through U.S. Mail order and 52 sets were sold at the ADF&G office in Kodiak. The remaining 174 sets were sold at the Dutch Harbor office.

The Bristol Bay red king crab Community Development Quota (CDQ) fishery was conducted immediately following the open access fishery. Ten sets of tags were sold for this fishery, two by mail and the remainder in the Dutch Harbor ADF&G office.

The 2000 Bering Sea snow crab season was delayed from its scheduled January 15, 2000 starting date to April 1, 2000. This delay was due to an unusually early southerly movement of the Bering Sea ice pack covering a large percentage of the area typically fished. A total of 232

tag sets were sold: 40 by mail, 49 from the Kodiak ADF&G office and the remaining 143 sets from the Dutch Harbor office.

Table 5-1. Bristol Bay, Area T of the Bering Sea, commercial red king crab catch statistics, 1966-1999.

Year	Number of			Harvest ^a (pounds)	Number of Pots		CPUE ^b	Deadloss (pounds)
	Vessels	Landings	Crabs ^a		Registered	Pulled		
1966	9	15	140,554	997,321		2,720	52	
1967	20	61	397,307	3,102,443		10,621	37	
1968	59	261	1,278,592	8,686,546		47,496	27	
1969	65	377	1,749,022	10,403,283		98,426	18	
1970	51	309	1,682,591	8,559,178		96,658	17	
1971	52	394	2,404,681	12,955,776		118,522	20	
1972	64	611	3,994,356	21,744,924		205,045	19	
1973	67	441	4,825,963	26,913,636		194,095	25	N/A
1974	104	605	7,710,317	42,266,274		212,915	36	N/A
1975	102	592	8,745,294	51,326,259		205,096	43	1,639,483
1976	141	984	10,603,367	63,919,728		321,010	33	875,327
1977	130	1,020	11,733,101	69,967,868		451,273	26	730,279
1978	162	926	14,745,709	87,618,320		406,165	36	1,273,037
1979	236	889	16,808,605	107,828,057		315,226	53	3,555,891
1980	236	1,251	20,845,350	129,948,463	78,352	567,292	37	1,858,668
1981	177	1,026	5,307,947	33,591,368	75,756	542,250	10	711,289
1982	90	255	541,006	3,001,210	36,166	141,656	4	95,834
1983			NO COMMERCIAL FISHERY					
1984	89	137	794,040	4,182,406	21,762	112,556	7	35,601
1985	128	130	796,181	4,174,953	30,117	85,003	9	6,436
1986	159	230	2,099,576	11,393,934	32,468	178,370	12	284,127
1987	236	311	2,122,402	12,289,067	63,000	220,871	10	120,388
1988	200	201	1,236,131	7,387,795	50,099	153,004	8	23,537
1989	211	287	1,684,706	10,264,791	55,000	208,684	8	81,334

-Continued-

Table 5-1. (Page 2 of 2)

Year	Number of			Harvest ^a (pounds)	Number of Pots		CPUE ^b	Deadloss (pounds)
	Vessels	Landings	Crab ^a		Registered	Pulled		
1990	240	331	3,120,326	20,362,342	69,906	262,131	12	116,527
1991	302	324	2,630,446	17,177,894	89,068	227,555	12	119,670
1992	281	289	1,196,958	8,043,018	68,189	205,940	6	9,000
1993	292	361	2,261,287	14,628,639	58,881	253,794	9	133,442
1994			NO COMMERCIAL FISHERY					
1995			NO COMMERCIAL FISHERY					
1996	196	198	1,249,005	8,405,614	39,461	76,433	16	24,166
1997	256	265	1,315,969	8,756,490	27,499	90,510	15	13,771
1998	274	284	2,140,607	14,233,063	56,420	141,707	15	53,716
1999	257	268	1,812,403	11,090,930	42,403	146,997	12	44,132

^aOpen access fishery only. Deadloss included.

^bDefined as catch of legal crab per pot.

Table 5-2. Bristol Bay commercial red king crab economic performance, 1980-1999.

Year	Harvest ^a	Value		Season Length	
		Exvessel	Total ^b	Days	Dates
1980	128,089,795	\$0.90	\$115.3	40	09/10-10/20
1981	32,880,079	\$1.50	\$49.3	91	09/10-12/15
1982	2,905,376	\$3.05	\$8.9	30	09/10-10/10
1983		NO COMMERCIAL FISHERY			
1984	4,146,805	\$2.60	\$10.8	15	10/01-10/16
1985	4,168,517	\$2.90	\$12.1	8	09/25-10/02
1986	11,109,807	\$4.05	\$45.0	13	09/25-10/07
1987	12,168,679	\$4.00	\$48.7	12	09/25-10/06
1988	7,364,258	\$5.10	\$37.6	8	09/25-10/02
1989	10,183,457	\$5.00	\$50.9	12	09/25-10/06
1990	20,245,815	\$5.00	\$101.2	12	11/01-11/13
1991	17,058,224	\$3.00	\$51.2	7	11/01-11-08
1992	8,034,018	\$5.00	\$40.2	7	11/01-11/08
1993	14,495,197	\$3.80	\$55.1	9	11/01-11/10
1994		NO COMMERCIAL FISHERY			
1995		NO COMMERCIAL FISHERY			
1996	8,381,448	\$4.01	\$33.6	4	11/01-11/05
1997	8,742,719	\$3.26	\$28.5	4	11/01-11/05
1998	14,179,347	\$2.64	\$37.4	5	11/01-11/06
1999	11,046,798	\$6.26	\$69.1	5	10/15-10/20

^aOpen access fishery only. Deadloss not included.

^bMillions of dollars.

Table 5-3. Bristol Bay commercial red king crab harvest composition by fishing season, 1973-1999.

Season	Percent		Size Limit ^a	Average		% Old Shell
	Recruit	Postrecruit		Weight (pounds)	Length (mm)	
1973	63	37	6¼	5.6		
1974	60	40	6¼	5.5		
1975	21	79	6¼ ^b	5.7		
1976	56	44	6½	6.0	148	27.4
1977	67	33	6½	5.9	148	13.0
1978	75	25	6½	5.9	147	6.9
1979	47	53	6½	6.4	152	10.4
1980	44	56	6½	6.2	151	11.0
1981	14	86	6½ ^c	6.3	151	47.4
1982	68	32	6½	5.5	145	24.6
1983	NO COMMERCIAL FISHERY					
1984	59	41	6½	5.2	142	26.5
1985	66	34	6½	5.2	142	25.8
1986	65	35	6½	5.4	142	25.5
1987	77	23	6½	5.8	145	19.0
1988	59	41	6½	6.0	147	15.1
1989	58	42	6½	6.1	148	17.7
1990	49	51	6½	6.5	152	14.7
1991	44	56	6½	6.5	152	12.1
1992	33	67	6½	6.7	153	22.3
1993	33	67	6½	6.5	152	15.2
1994	NO COMMERCIAL FISHERY					
1995	NO COMMERCIAL FISHERY					
1996 ^d	31	69	6½	6.7	153	24.3
1997 ^d	28	72	6½	6.7	152	11.0
1998 ^d	40	60	6½	6.7	152	19.1 ^e
1999 ^d	72	28	6½	6.1	148	6.3

^aMinimum carapace width in inches.

^b6½ inches after 11/01.

^c7 inches after 10/20

^dLegal sized old and new shell greater than 153 mm defined as postrecruits.

^eIncludes all skip molt crabs.

Table 5-4. Bristol Bay commercial red king crab catch by statistical area, 1999.

Statistical Area	Number of		Pounds ^a	Pots Lifted	Average		Deadloss (pounds)
	Landings	Crab ^a			CPUE	Weight	
605630	5	22,513	131,938	1579	14	5.9	334
615601	6	16,229	97,966	1,413	12	6.0	133
615630	37	182,652	1,115,952	14,092	13	6.1	6,734
615700	10	37,372	235,013	2,446	15	6.3	1,203
625531	8	29,904	180,417	1,700	18	6.0	1,421
625600	86	361,221	2,186,683	30,124	12	6.1	9,199
625630	96	329,106	2,007,503	32,011	10	6.1	6,810
625700	20	73,099	444,399	5,919	12	6.1	1,751
635530	30	183,052	1,152,375	7,768	24	6.3	4,015
635600	43	153,093	929,535	10,432	15	6.1	4,331
635630	74	313,640	1,928,200	29,779	11	6.2	6,325
635700	16	49,535	306,312	5,075	10	6.2	1,040
645600	3	20,075	118,147	1,625	12	5.9	294
645630	3	12,779	82,678	1,160	11	6.5	199
Other ^b	6	28,133	173,812	1,874	12	6.1	343
TOTALS	268 ^c	1,812,403	11,090,930	146,997	12	6.1	44,132

^aDeadloss included.

^bIncludes six statistical areas when less than three vessels made landings.

^cTotal landings for the fishery, does not reflect statistical area landing totals.

Table 5-5. Bristol Bay cost recovery harvest statistics 1990-1999.

Year ^a	Number of		Harvest ^b (pounds)	Number of Pots Pulled	Average		Deadloss (pounds)
	Landings	Crabs ^b			CPUE	Weight	
1990	3	9,567	80,701	870	15.6	5.9	24,540
1991	2	30,351	205,851	518	62.4	6.4	12,817
1992	1	11,213	74,089	670	17.4	6.3	3,000
1993	1	8,384	53,200	464	18.3	6.3	800
1994	1	14,806	93,336	732	21.3	6.0	4,500
1995	2	14,123	80,158	564	25.8	5.5	2,339
1996	3	15,390	107,955	355	44.1	6.9	1,918
1997	4	21,698	154,739	658	37.3	6.3	18,040
1998	2	22,230	188,176	738	36.4	7.0	32,564
1999	2	12,438	79,765	698	17.9	6.4	165
1999 ^c	2	16,930	106,179	541	31.0	6.3	245

^aAll cost recovery activities from 1990-1998 were conducted to fund Bering Sea research.

^bDeadloss included.

^cConducted to fund a portion of the Bering Sea and Aleutian Islands king and Tanner crab onboard observer deployment costs.

Table 5-6. Bristol Bay red king crab cost recovery economic performance 1990-1999.

Year ^a	Harvest ^b (pounds)	Value		Charter Dates	Days
		Exvessel (dollars)	Total (thousand)		
1990	56,161	\$5.10	286.4	08/7-09/7	30
1991	193,034	\$3.75	723.9	09/2-10/7	35
1992	71,089	\$5.24	372.5	10/8-10/23	15
1993	52,400	\$6.57	344.3	08/20-09/20	31
1994	88,836	\$5.21	462.8	09/25-10/25	30
1995	77,819	\$6.65	517.5	08/1-08/31	31
1996	106,037	\$4.53	480.4	08/1-08/31	31
1997	136,699	\$3.55	485.2	07/25-08/21	28
1998	155,612	\$3.25	505.7	08/1-08/28	28
1999	79,600	\$6.02	478.8	09/25-10/11	17
1999 ^c	105,934	\$6.32	669.5	10/25-11/10	17

^aAll cost recovery activities from 1990-1998 were conducted to fund Bering Sea research.

^bDeadloss not included.

^cConducted to fund a portion of the Bering Sea and Aleutian Island king and Tanner observer deployment costs.

Table 5-7. Bering Sea, Area Q, Pribilof District commercial red and blue king crab catch statistics, 1973/74-1999.

Year ^a	Number of		Harvest ^b (pounds)	Number of Pots		CPUE ^c	Average		Deadloss (pounds)
	Vessels	Landings		Registered	Pulled		Weight (pounds)	Length ^d (mm)	
1973/74	8	13	174,420		6,814	26	7.3	N/A	0
1974/75	70	101	908,072		45,518	20	7.8	157.8	0
1975/76	20	54	314,931		16,297	19	7.7	159.1	0
1976/77	47	113	855,505		71,738	12	7.7	158.1	0
1977/78	34	104	807,092		106,983	8	7.9	158.9	159,269
1978/79	58	154	797,364		101,117	8	8.1	159.3	63,140
1979/80	46	115	815,557		83,527	10	7.7	155.9	284,555
1980/81	110	258	1,497,101	31,636	167,684	9	7.3	155.7	287,285
1981/82	99	312	1,202,499	25,408	176,168	7	7.6	158.2	250,699
1982/83	122	281	587,908	34,429	127,728	5	7.5	159.8	51,703
1983/84	126	221	276,364	36,439	86,428	3	7.9	159.9	4,562
1984/85	16	25	40,427	3,122	15,147	3	7.6	155.5	0
1985/86	26	49	77,607	6,038	23,483	3	6.9	146.5	7,500
1986/87	16	25	36,988	4,376	15,800	2	7.0	N/A	5,450
1987/88	38	68	95,131	9,594	40,507	2	7.4	152.7	9,910
1988/89				NO COMMERCIAL FISHERY					
1989/90				NO COMMERCIAL FISHERY					
1990/91				NO COMMERCIAL FISHERY					
1991/92 ^e				NO COMMERCIAL FISHERY					
1992/93				NO COMMERCIAL FISHERY					
1993 ^f	112	135	380,217	4,860	35,942	11	6.9	154.4	0
1994 ^f	104	121	167,520	4,675	28,976	6	8.0	162.1	2,929

-Continued-

Table 5-7. (Page 2 of 2)

Year ^a	Number of			Harvest ^b (pounds)	Number of Pots		CPUE ^c	Average		Deadloss (pounds)
	Vessels	Landings	Crabs ^b		Registered	Pulled		Weight (pounds)	Length ^d (mm)	
1995 ^f	117	151	107,521	871,173		33,531	3	8.1	162.5	15,316
1995 ^g	119	152	172,987	1,267,454		34,721	5	7.3	N/A	46,263
1995 ^h	127	162	280,508	2,138,627	5,400	37,643	8	NA		61,579
1996 ^f	66	90	25,383	200,304		29,425	<1	7.9	161.0	319
1996 ^g	66	92	127,676	937,032		30,607	4	7.3	153.1	14,997
1996 ^h	66	92	153,059	1,137,336	2,730	60,032	3	7.4		15,316
1997 ^f	53	110	90,641	756,818		28,458	3	8.4	164.3	18,807
1997 ^g	51	105	68,603	512,374		27,652	3	7.5	163.6	16,747
1997 ^h	53	110	159,244	1,269,192	2,230	30,400	5	8.0		35,554
1998 ^f	57	84	68,129	510,365		23,381	3	7.5	158.8	8,703
1998 ^g	57	83	68,513	516,996		22,965	3	7.5	156.1	22,289
1998 ^h	57	84	136,642	1,027,361	2,398	23,381	3	7.5		30,992
1999	NO COMMERCIAL FISHERY									

^aBlue king crab, 1973 - 1988.^bDeadloss included.^cDefined as catch of legal crabs per pot.^dCarapace length.^e10,869 pounds illegal red king crab harvested.^fRed king crab.^gBlue king crab.^hBlue and red king crab fisheries combined.

Table 5-8. GHL, economic performance and season length summary of the commercial red and blue king crab fishery, in the Pribilof District of the Bering Sea, 1980/81-1999.

Year ^a	GHL ^b	Value		Season Length	
		Exvessel	Total ^c	Days	Dates
1980/81	5.0-8.0	\$0.90	\$9.6	60	09/15-11/15
1981/82	5.0-8.0	\$1.50	\$13.6	47	09/10-10/28
1982/83	5.0-8.0	\$3.05	\$13.4	15	09/10-09/25
1983/84	4.0 ^d	\$3.00	\$6.6	10	09/01-09/11
1984/85	0.5-1.0	\$2.50	\$0.1	15	09/01-09/16
1985/86	0.3-0.8	\$2.90	\$1.4	26	09/25-10/21
1986/87	0.3-0.8	\$4.05	\$1.2	55	09/25-11/20
1987/88	0.3-1.7	\$4.00	\$2.8	86	09/25-12/20
1988/89		NO COMMERCIAL FISHERY			
1989/90		NO COMMERCIAL FISHERY			
1990/91		NO COMMERCIAL FISHERY			
1991/92		NO COMMERCIAL FISHERY			
1992/93		NO COMMERCIAL FISHERY			
1993 ^e	3.4	\$4.98	\$13.0	6	09/15-09/21
1994 ^e	2.0 ^d	\$6.45	\$8.6	6	09/15-09/21
1995 ^e	2.5 ^g	\$3.37	\$2.9	7	09/15-09/22
1995 ^f	2.5 ^g	\$2.92	\$3.9	7	09/15-09/22
1996 ^e	1.8 ^g	\$2.76	\$0.6	11	09/15-09/26
1996 ^f	1.8 ^g	\$2.65	\$2.4	11	09/15-09/26
1997 ^e	1.5 ^g	\$3.09	\$2.3	14	09/15-09/29
1997 ^f	1.5 ^g	\$2.82	\$1.4	14	09/15-09/29
1998 ^e	1.25 ^{g,h}	\$2.39	\$1.2	13	09/15-09/28
1998 ^f	1.25 ^{g,h}	\$2.34	\$1.2	13	09/15-09/28
1999		NO COMMERCIAL FISHERY			

^aBlue king crab, 1980-1988.

^bGuideline harvest level.

^cMillions of dollars.

^dSet not to exceed.

^eRed king crab.

^fBlue king crab.

^gCombined red and blue king crab.

^hOpen access fishery only.

Table 5-9. Commercial harvest of blue king crabs in the St. Matthew Island Section of statistical Area Q, 1977-1999.

Year	Number of		Harvest ^a (pounds)	Number of Pots		CPUE ^b	Percent Recruits	Average		Deadloss (pounds)
	Vessels	Landings		Registered	Pulled			Weight (pounds)	Length ^c (mm)	
1977	10	24	281,665		17,370	16	7	4.3	130.4	129,148
1978	22	70	436,126		43,754	10	N/A	4.5	132.2	116,037
1979	18	25	52,966		9,877	5	81	4	128.8	128.8
1980				CONFIDENTIAL						
1981	31	119	1,045,619		58,550	18	N/A	4.4	N/A	53,355
1982	96	269	1,935,886		165,618	12	20	4.6	135.1	142,973
1983	164	235	1,931,990	38,000	133,944	14	27	4.8	137.2	828,994
1984	90	169	841,017	14,800	73,320	11	34	4.5	135.5	31,983
1985	79	103	484,836	13,000	51,606	9	9	5	139	2,613
1986	38	43	219,548	5,600	22,093	10	10	4.6	134.3	32,560
1987	61	62	234,521	9,370	28,440	8	5	4.6	134.1	400
1988	46	46	302,053	7,780	10,160	30	65	4.4	133.3	22,358
1989	69	69	247,641	11,983	30,853	8	9	4.7	134.6	3,754
1990	31	38	391,405	6,000	26,264	15	4	4.4	134.3	17,416
1991	68	69	726,519	13,100	37,104	20	12	4.6	134.1	216,459
1992	174	179	544,956	17,400	56,630	10	9	4.6	134.1	0
1993	92	136	629,874	5,895	58,647	11	6	4.8	135.4	0
1994	87	133	827,015	5,685	60,860	14	60	4.6	133.3	46,699
1995	90	111	666,905	5,970	48,560	14	45	4.8	135	90,191
1996	122	189	661,115	8,010	91,205	7	47	4.7	134.6	36,892
1997	117	166	939,822	7,650	81,117	12	31	4.9	139.5	209,490
1998	131	255	612,346	8,561	89,500	7	46	4.7	135.8	14,417
1999				NO COMMERCIAL FISHERY						

^aDeadloss included.

^bDefined as catch of legal crabs per pot pull.

^cCarapace length.

Table 5-10. GHL, inseason order projections and actual commercial harvests for the St. Matthew Island section blue king crab fishery, 1983-1999.

Year	Guideline Harvest Levels ^a	Projected Harvest ^a	Actual Harvest ^{a,b}
1983	8.0	8.0	9.5
1984	2.0 - 4.0	4.0	3.8
1985	0.9 - 1.9	2.0	2.4
1986	0.2 - 0.5	1.0	1.0
1987	0.6 - 1.3	1.3	1.1
1988	0.7 - 1.5	1.5	1.3
1989	1.7	1.7	1.2
1990	1.9	1.9	1.7
1991	3.2	3.2	3.4
1992	3.1	3.1	2.5
1993	4.4	4.4	3.0
1994	3.0	3.0	3.8
1995	2.4	2.4	3.2
1996	4.3	4.3	3.1
1997	5.0	5.0	4.6
1998	4.0 ^c	2.9	2.9
1999	NO COMMERCIAL FISHERY		

^aMillions of pounds, based on inseason catch reports from fisheries.

^bDeadloss included.

^cOpen access fishery only.

Table 5-11. Commercial harvest of king crabs, by season and species, for the St. Matthew Island Section of the Northern District of the Bering Sea, 1977-1999.

Season	Date		Species	Harvest ^a	Minimum Size ^b	Price per Pound
	Opened	Closed				
1977	Jun-07	Aug. 16	Blue	1,202,066	5 1/2	\$1.00
			Red	543,041	5	
1978	Jul-15	Sept. 3	Blue	1,984,251	5 1/2	\$0.95
	Jul-15	Aug. 16	Red	2,007,910	4 3/4	
1979	Jul-15	Aug. 24	Blue	210,819	5 1/2	\$0.70
	Jul-15	Aug. 16	Red	3,024,228	4 3/4	
1980	Jul-15	Sept. 3	Blue			\$0.75
	Jul-15	Jul-31	Red	353,683	4 3/4	
1981	Jul-15	Aug. 21	Blue	4,627,761	5 1/2	\$0.90
	Jul-15	Sept. 3	Red	63,983	4 3/4	
1982	Aug-01	Aug. 16	Blue	8,844,789	5 1/2	\$2.00
	Aug-01	Aug. 16	Red	3,690	4 3/4	\$2.00
	May-01	Aug. 1	Golden	193,507	5 1/2	\$2.00
1983 ^{cd}	Aug-20	Sept. 6 ^c	Blue	9,506,880 ^d	5 1/2	\$3.00
	Aug-20	Sept. 6	Red	1,635	4 3/4	\$2.50
	May-01	Aug. 1	Golden		5 1/2	-
1984	Aug-01	Sept. 8	Blue	3,764,592	5 1/2	\$1.75
	Aug-01	Sept. 8	Red	-	4 3/4	-
	May-01	Dec. 31	Golden ^c	-	5 1/2	-
1985	Sep-01	Sept. 6	Blue	2,427,110	5 1/2	\$1.60
	Aug-01	Sept. 6	NO CATCH REPORTED		4 3/4	
	Jan-01	Dec. 31	NO CATCH REPORTED		5 1/2	
1986	Sep-01	Sept. 6	Blue	1,003,162	5 1/2	\$3.20
	Aug-01	Sept. 6	NO CATCH REPORTED		4 3/4	
	Jan-01	Dec. 31	NO CATCH REPORTED		5 1/2	

- Continued -

Table 5-11. (Page 2 of 2)

Season	Date		Species	Harvest ^a	Minimum Size ^b	Price per Pound
	Opened	Closed				
1987	Sep-01	Sep-05	Blue	1,075,179	5 1/2	\$2.85
	Aug-01	Sep-05	NO CATCH REPORTED		4 3/4	
	Jan-01	Dec-31	Golden	424,394	5 1/2	\$2.60
1988	Sep-01	Sep-05	Blue	1,325,185	5 1/2	\$3.10
	Aug-01	Sep-05	NO CATCH REPORTED		4 3/4	
	Jan-01	Dec-31	Golden	160,441	5 1/2	\$3.10
1989	Jan-01	Sep-04	Blue	1,166,258	5 1/2	\$2.90
			Blue	0 ^e	5 1/2	NA
	Aug-01	Sep-04	Red	4,518	4 3/4	NA
	Jan-01	Dec-31	Golden	4,407	5 1/2	NA
1990	Sep-01	Sep-07	Blue	1,725,349	5 1/2	\$3.35
1991	Sep-16	Sep-20	Blue	3,372,066	5 1/2	\$2.80
1992	Sep-04	Sep-07	Blue	2,474,080	5 1/2	\$3.00
1993	Sep-15	Sep-21	Blue	2,999,921	5 1/2	\$3.23
1994	Sep-15	Sep-22	Blue	3,764,262	5 1/2	\$4.00
1995	Sep-15	Sep-22	Blue	3,166,093	5 1/2	\$2.32
1996	Sep-15	Sep-16	Blue	3,080,916	5 1/2	\$2.20
1997	Sep-15	Sep-22	Blue	4,649,660	5 1/2	\$2.21
1998	Sep-15	Sep-26	Blue	2,868,965	5 1/2	\$1.87
1999	NO COMMERCIAL FISHERY					

^aIn pounds, deadloss included.^bCarapace width in inches.^cSome of Northern District open until September 20.^dSt. Lawrence Island harvest of 52,557 lbs. included.^eCombined with red king crab to total 4,518 pounds.

Table 5-12. GHL, economic performance and season length summary
of the commercial blue king crab fishery in the St. Matthew Island
Section of the Northern District of the Bering Sea, 1983-1999.

Year	GHL ^a	Value		Season Length	
		Exvessel	Total ^b	Days	Dates
1983	8	\$3.00	\$25.80	17	08/20-09/06
1984	2.0-4.0	\$1.75	\$6.50	7	09/01-09/08
1985	0.9-1.9	\$1.60	\$3.80	5	09/01-09/06
1986	0.2-0.5	\$3.20	\$3.20	5	09/01-09/06
1987	0.6-1.3	\$2.85	\$3.10	4	09/01-09/05
1988	0.7-1.5	\$3.10	\$4.00	4	09/01-09/05
1989	1.7	\$2.90	\$3.50	3 ^c	09/01-09/04
1990	1.9	\$3.35	\$5.70	6	09/01-09/07
1991	3.2	\$2.80	\$9.00	4	09/16-09/20
1992	3.1	\$3.00	\$7.40	3 ^c	09/04-09/07
1993	4.4	\$3.23	\$9.70	6	09/15-09/21
1994	3.0	\$4.00	\$15.00	7	09/15-09/22
1995	2.4	\$2.32	\$7.10	5	09/15-09/20
1996	4.3	\$2.20	\$6.70	8	09/15-09/23
1997	5.0	\$2.21	\$9.80	7	09/15-09/22
1998	4.0 ^d	\$1.87	\$5.34	11	09/15-09/26
1999	NO COMMERCIAL FISHERY				

^aGuideline harvest level.

^bMillions of dollars.

^cActual length - 60 hours.

^dOpen access fishery GHL.

Table 5-13. Area Q, Pribilof District golden king crab fishery data, 1981/82-1999 seasons.

Season	Number of			Harvest ^{a,b}	Pots lifted	CPUE ^c	Average		Deadloss ^b
	Vessels	Landings	Crabs ^a				Weight ^b	Length ^d	
1981/82	2				CONFIDENTIAL				
1982/83	10	19	15,330	69,970	5,252	3	4.6	151	570
1983/84	50	115	253,162	856,475	26,035	10	3.4	127	20,041
1984					NO LANDINGS				
1985	1				CONFIDENTIAL				
1986	1				CONFIDENTIAL				
1987	1				CONFIDENTIAL				
1988	2				CONFIDENTIAL				
1989	2				CONFIDENTIAL				
1990					NO LANDINGS				
1991	1				CONFIDENTIAL				
1992	1				CONFIDENTIAL				
1993	5	15	17,643	67,458	15,395	1	3.8	NA	0
1994	3	5	21,477	88,985	1,845	12	4.1	NA	730
1995	7	22	82,456	341,700	9,481	9	4.1	NA	716
1996	6	32	91,947	329,009	9,952	9	3.6	NA	3,570
1997	7	23	43,305	179,249	4,673	9	4.1	NA	5,554
1998	3	9	9,205	35,722	1,530	6	3.9	NA	474
1999	3	9	44,098	177,108	2,995	15	4.0	NA	319

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lift.

^dIn millimeters.

5-14. Area Q, Pribilof District golden king crab fishery economic performance data, 1991-1999 seasons.

Season	Value		Season Length	
	Exvessel ^a	Fishery	Days	Dates
1991	CONFIDENTIAL		365	1/1-12/31
1992	CONFIDENTIAL		365	1/1-12/31
1993	\$2.42	\$163,248	365	1/1-12/31
1994	\$3.81	\$336,252	365	1/1-12/31
1995	\$3.12	\$1,056,900	365	1/1-12/31
1996	\$2.02	\$639,532	365	1/1-12/31
1997	\$2.23	\$387,340	365	1/1-12/31
1998	\$2.06	\$72,611	365	1/1-12/31
1999	\$2.34	\$413,686	162	1/1-6/10

^aPrice per pound.

Table 5-15. Area Q, Northern District, St. Matthew Island Section golden king crab fishery data, 1982/83-1999 seasons.

Season	Number of			Harvest ^{a,b}	Pots lifted	CPUE ^c	Average		Deadloss ^b
	Vessels	Landings	Crabs ^a				Weight ^b	Length ^d	
1982/83	22	30	51,714	193,507	7,825	7	3.7	138	957
1983/84						NO LANDINGS			
1985						NO LANDINGS			
1986						NO LANDINGS			
1987	11	29	101,618	424,394	14,525	7	4.2	142	11,750
1988	11	23	36,270	160,441	11,672	3	4.4	150	14,000
1989	2					CONFIDENTIAL			
1990						NO LANDINGS			
1991						NO LANDINGS			
1992	1					CONFIDENTIAL			
1993						NO LANDINGS			
1994	1					CONFIDENTIAL			
1995	4	4	245	1,200	383	1	4.9	NA	0
1996	1					CONFIDENTIAL			
1997						NO LANDINGS			
1998						NO LANDINGS			
1999						NO LANDINGS			

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lift.

^dIn millimeters.

Table 5-16. Area Q, Northern District, St. Matthew
Island Section golden king crab fishery
economic performance data, 1991-1999
seasons.

Season	Value		Season Length	
	Exvessel ^a	Total	Days	Dates
1991	NO LANDINGS		365	1/1-12/31
1992	CONFIDENTIAL		365	1/1-12/31
1993	NO LANDINGS		365	1/1-12/31
1994	CONFIDENTIAL		365	1/1-12/31
1995	\$3.12	\$3,744	365	1/1-12/31
1996	CONFIDENTIAL		365	1/1-12/31
1997	NO LANDINGS		365	1/1-12/31
1998	NO LANDINGS		365	1/1-12/31
1999	NO LANDINGS		365	1/1-12/31

^aPrice per pound.

Table 5-17. Pribilof District golden king crab catch by statistical area, 1999.

Statistical area	Number of		Harvest ^{a,b}	Pots lifted	Average		
	Landings	Crab ^a			CPUE ^c	Weight ^b	Deadloss ^b
695530	2	9,389	36,723	522	18	3.9	266
695600	7	34,134	138,026	2,426	14	4.0	53
705530	1	575	2,359	47	12	4.1	

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lift.

Table 5-18. Bering Sea scarlet king crab fishery data, 1992-1999.

Year	Number of vessels	Harvest ^{a,b}	Pots Lifted	Value		Average		
				exvessel ^c	fishery ^d	Weight ^a	CPUE ^e	Deadloss ^a
1992					NO LANDINGS			
1993					NO LANDINGS			
1994					NO LANDINGS			
1995	4	26,684	24,551	\$2.12	\$0.06	2.4	<1	465
1996	2				CONFIDENTIAL			
1997					NO LANDINGS			
1998					NO LANDINGS			
1999					NO LANDINGS			

^aIn pounds.

^bDeadloss included.

^cPrice per pound.

^dIn millions of dollars.

^eNumber of legal crabs per pot lift.

Table 5-19. Commercial harvest statistics, by season, for the Bering Sea Tanner crab fishery, 1969-1999.

Year	Number of			Harvest ^a (pounds)	Number of Pots		CPUE ^b	Deadloss (pounds)
	Vessels	Landings	Crab ^a		Registered	Pulled		
1969	NA	131	353,300	1,008,900		29,800	12	NA
1970	NA	66	482,300	1,014,700		16,400	29	NA
1971	NA	22	61,300	166,100		7,300	8	NA
1972	NA	14	42,061	107,761		4,260	10	NA
1973	NA	44	93,595	231,668		15,730	6	NA
1974	NA	69	2,531,825	5,044,197		22,014	115	NA
1974/75	28	80	2,773,770	7,028,378		38,462	72	NA
1975/76	66	304	8,956,036	22,358,107		141,206	63	NA
1976/77	83	541	20,251,508	51,455,221		297,471	68	NA
1977/78	120	861	26,350,688	66,648,954		516,350	51	218,099
1978/79	144	817	16,726,518	42,547,174		402,697	42	76,000
1979/80	152	804	14,685,611	36,614,315	40,273	488,434	30	56,446
1981	165	761	11,845,958	29,630,492	42,910	559,626	21	101,594
1982	125	791	4,830,980	11,008,779	36,396	490,099	10	138,159
1983	108	448	2,286,756	5,273,881	15,255	282,006	8	60,029
1984	41	134	516,877	1,208,223	9,851	61,357	8	5,025
1985	44	166	1,283,474	3,151,498	15,325	104,707	12	14,096
1986				NO COMMERCIAL FISHERY				
1987				NO COMMERCIAL FISHERY				
1988	98	248	897,059	2,210,394	38,765	112,334	8	10,724
1989	109	359	2,907,021	7,012,965	43,607	184,892	16	34,664
1990	179	1,032	10,717,924	24,549,299	46,440	711,137	15	87,475
1990/91	255	1,756	16,608,625	40,081,555	75,356	883,391	19	210,769
1991/92	285	2,339	12,924,034	31,796,381	85,401	1,244,633	10	279,741

-Continued-

Table 5-19. (Page 2 of 2)

Year	Number of			Harvest ^a (pounds)	Number of Pots		CPUE ^b	Deadloss (pounds)
	Vessels	Landings	Crab ^a		Registered	Pulled		
1992/93	294	2,084	15,265,880	35,130,866	71481	1,200,885	13	343,955
1993/94	296	862	7,235,498	16,891,320	116,039	576,464	13	258,389
1994	183	349	3,351,639	7,766,886	38,670	249,536	13	132,780
1995	196	256	1,877,303	4,233,061	40,827	247,853	8	44,508
1996 ^c	196	347	734,296	1,806,077	68,602	149,289	5	14,608
1997				NO COMMERCIAL FISHERY				
1998				NO COMMERCIAL FISHERY				
1999				NO COMMERCIAL FISHERY				

^aDeadloss included.

^bDefined as catch of legal crab per pot.

^cIncludes incidental catch with Bristol Bay red king crab and Tanner crab directed fishery totals.

Table 5-20. Bering Sea Tanner crab commercial catch by subdistrict, 1974/75-1999.

Season	Subdistrict	Number of			Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
		Vessels	Landings	Crab ^a			Weight (pounds)	CPUE ^b	
1974/75	Southeastern		72	2,526,687	6,504,984	32,275	2.6	78	0
	Pribilofs	28	8	247,083	523,394	3,923	2.1	63	0
	TOTAL		80	2,773,770	7,028,378	38,462	2.5	72	0
1975/76	Southeastern		230	6,682,232	16,643,194	106,445	2.5	63	0
	Pribilofs		74	2,273,804	5,714,913	34,761	2.5	65	0
	TOTAL	66	304	8,956,036	22,358,107	141,206	2.5	63	0
1976/77	Southeastern		437	16,089,057	41,007,736	233,667	2.6	69	0
	Pribilofs		104	4,162,451	10,447,485	63,804	2.5	65	0
	TOTAL	83	541	20,251,508	51,455,221	297,471	2.5	68	0
1977/78	Southeastern		706	21,055,527	53,278,012	408,437	2.5	52	0
	Pribilofs		155	5,210,170	13,152,843	107,913	2.5	48	0
	TOTAL	120	861	26,350,688	66,648,954	516,350	2.5	51	218,099
1978/79	Southeastern		758	15,601,891	39,694,205	356,594	2.5	44	75,400
	Pribilofs		59	1,124,627	2,852,969	46,103	2.5	24	600
	TOTAL	144	817	16,726,518	42,547,174	402,697	2.5	42	76,000
1979/80	Southeastern		789	14,329,889	35,724,003	476,410	2.5	30	56,446
	Pribilofs		15	355,722	890,312	12,024	2.5	30	0
	TOTAL	152	804	14,685,611	36,614,315	488,434	2.5	30	56,446
1981	Southeastern		674	10,532,007	26,684,956	496,751	2.5	21	97,398
	Pribilofs		87	1,313,951	2,945,536	62,875	2.5	21	4,196
	TOTAL	165	761	11,845,958	29,630,492	559,626	2.5	21	101,594

-Continued-

Table 5-20. (page 2 of 3)

Season	Subdistrict	Number of			Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
		Vessels	Landings	Crab ^a			Weight (pounds)	CPUE ^b	
1982	Southeastern		539	3,825,433	8,812,302	322,634	2.3	12	69,829
	Pribilofs		252	1,005,547	2,196,477	167,465	2.2	6	68,330
	TOTAL	125	791	4,830,980	11,008,779	490,099	2.3	10	138,159
1983	Northern		10	29,478	48,454	5,950	1.7	5	167
	Southeastern		287	1,984,673	4,633,354	192,538	2.3	10	52,879
	Pribilofs		151	272,505	592,073	83,528	2.2	3	6,983
	TOTAL	108	448	2,286,756	5,273,881	282,006	2.3	8	60,029
1984	Southeastern		91	470,181	1,099,142	44,546	2.3	11	4,688
	Pribilofs		43	46,759	109,081	16,811	2.3	3	337
	TOTAL	41	134	516,877	1,208,223	61,357	2.3	8	5,025
1985	Southeastern	38	143	1,278,109	3,139,041	96,976	2.4	13	14,096
	Pribilofs	15	23	5,365	12,457	7,731	2.3	1	0
	TOTAL	44	166	1,283,474	31,513,498	104,707	2.4	12	14,096
1986			NO COMMERCIAL FISHERY						
1987			NO COMMERCIAL FISHERY						
1988	Eastern	98	248	897,059	2,210,394	112,334	2.5	8	10,724
	Western	0	0	0	0	0	0	0	0
	TOTAL	98	248	897,059	2,210,394	112,334	2.5	8	10,724
1990	Eastern		1,105	10,708,996	24,529,165	701,924	2.3	15	87,475
	Western		17	8,928	20,134	9,213	2.3	1	0
	TOTAL	179	1,032	10,717,924	24,549,299	711,137	2.3	15	87,475

-Continued-

Table 5-20. (page 3 of 3)

Season	Subdistrict	Number of			Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
		Vessels	Landings	Crab ^a			Weight (pounds)	CPUE ^b	
1990/91	Eastern	255	1,756	16,608,625	40,081,555	883,391	2.4	19	210,769
	Western	0	0	0	0	0	0	0	0
	TOTAL	255	1,756	16,608,625	40,081,555	883,391	2.4	19	210,769
1991/92	Eastern	285	2,339	12,924,034	31,796,381	1,244,633	2.5	10	279,741
1992/93	Eastern	293	2,011	15,074,084	34,821,043	1,150,834	2.3	13	340,955
	Western	70	96	191,796	309,823	50,051	1.6	4	3,000
	TOTAL	294	2,084	15,265,880	35,130,866	1,200,885	2.3	13	343,955
1993/94	East of 168° ^c	283	347	1,696,430	4,114,949	250,501	2.4	7	103,715
	163° to 173° ^d	261	515	5,539,068	12,776,371	325,963	2.3	17	154,674
	TOTAL	296	862	7,235,498	16,891,320	576,464	2.3	13	258,389
1994	163° to 173°	183	349	3,351,639	7,766,886	249,536	2.3	13	132,780
1995	163° to 173°	196	256	1,877,303	4,233,061	247,853	2.3	8	44,508
1996	East of 168° ^c	192	195	393,257	994,776	75,753	2.5	5	8,464
	163° to 173° ^d	135	152	341,039	811,301	73,522	2.4	5	6,144
	TOTAL	196	347	734,296	1,806,077	149,275	2.5	5	14,608
1997				NO COMMERCIAL FISHERY					
1998				NO COMMERCIAL FISHERY					
1999				NO COMMERCIAL FISHERY					

^aDeadloss included.^bDefined as catch of legal crabs per pot pull.^cBycatch in Bristol Bay red king crab fishery.^dDirected Tanner crab fishery.

Table 5-21. Economic performance of the Bering Sea Tanner crab commercial fishery, 1979/80-1999.

Year	GHL ^a	Value		Season Length	
		Exvessel (per lb.)	Total ^b	Days	Dates
1979/80	28-36	\$0.52	\$19.0	189	11/01-05/11
1981	28-36	\$0.58	\$17.2	88	01/15-04/15
1982	12-16	\$1.06	\$11.5	118	02/15-06/15
1983	5.6	\$1.20	\$6.2	118	02/15-06/15
1984	7.1	\$0.95	\$1.1	118	02/15-06/15
1985	3	\$1.40	\$4.3	149	01/15-06/15
1986		NO COMMERCIAL FISHERY			
1987		NO COMMERCIAL FISHERY			
1988	5.6	\$2.17	\$4.8	93	01/15-04/20
1989	13.5	\$2.90	\$20.3	110	01/15-05/07
1990 ^c	29.5	\$1.85	\$45.3	89	01/15-04/24
1990/91	42.8	\$1.12	\$44.5	126	11/20-03/25
1991/92	32.8	\$1.50	\$47.3	137	11/15-03/31
1992/93	39.2	\$1.69	\$58.8	137	11/15-03/31
1993 ^d	10.7	\$1.90	\$7.6	10	11/01-11/10
1993/94 ^e	9.1	\$1.90	\$24.0	42	11/20-01/01
1994 ^e	7.5	\$3.75	\$28.5	20	11/01-11/21
1995 ^e	5.5	\$2.80	\$11.7	15	11/01-11/16
1996 ^d	2.2	\$2.51	\$2.5	4	11/01-11/05
1996 ^e	6.2	\$2.48	\$2.0	12	11/15-11/27
1996	8.4	NA	\$4.5	16	NA
1997		NO COMMERCIAL FISHERY			
1998		NO COMMERCIAL FISHERY			
1999		NO COMMERCIAL FISHERY			

^aGuideline Harvest Level

^bMillions of dollars.

^cWinter fishery.

^dEast of 168° West longitude (incidental to Bristol Bay red king crab).

^e163° -173° West longitude (directed fishery).

Table 5-22. Bering Sea commercial Tanner crab harvest composition by fishing season, 1970-1999.

Season	Average		% New Shell
	Weight (pounds)	Width (mm)	
1972 ^a	2.6		
1973 ^a	2.5		
1974 ^a	2		
1974/75	2.5		
1975/76	2.5		
1976/77	2.5		
1977/78	2.5	152.8	88.0
1978/79	2.5	152.7	95.0
1979/80	2.5	151.4	90.0
1981	2.5	149.4	86.6
1982	2.3	148.8	85.4
1983 ^b	2.3	148.8	70.5
1984	2.3	146.5	40.0
1985	2.4	150.0	65.0
1986	NO COMMERCIAL FISHERY		
1987	NO COMMERCIAL FISHERY		
1988	2.5	143.5	70.2
1989	2.4	149.4	80.8
1990	2.3	148.1	96.5
1990/91	2.4	149.7	95.3
1991/92	2.5	150.4	93.2
1992/93	2.3	148.0	90.5
1993/94	2.4	150.7	93.9
1994	2.3	150.0	92.5
1995	2.3	149.3	58.6
1996 ^c	2.5	152.1	46.6
1997	NO COMMERCIAL FISHERY		
1998	NO COMMERCIAL FISHERY		
1999	NO COMMERCIAL FISHERY		

^aIncidental to the king crab fishery.

^bPartial Bering Sea closure.

^cIncludes incidental catch with Bristol Bay red king crab and Tanner crab directed fishery totals.

Table 5-23. Bering Sea commercial snow crab catch statistics by season, 1978/79-1999.

Year	Number of			Harvest ^a (pounds)	Number of Pots		CPUE ^c	% New Shell	Average		Deadloss (pounds)
	Vessels	Landings	Crab ^a		Registered ^b	Pulled			Weight (pounds)	Width ^d (mm)	
1978/79	102	490	22,118,498	32,187,039		190,746	116	83.0	1.5	113.1	759,137
1979/80	134	597	25,286,777	39,572,668	35,503	255,102	99	90.0	1.6	118.1	228,345
1981	153	867	34,415,322	52,750,034	39,789	435,742	79	79.2	1.5	117	2,269,979
1982	122	803	24,089,562	29,355,374	35,522	469,091	51	78.0	1.2	109.4	1,092,655
1983 ^e	109	461	23,853,647	26,128,410	15,396	287,127	83	NA	1.1	NA	1,324,466
1984 ^e	52	367	24,009,935	26,813,074	12,493	173,591	138	78.0	1.1	105.4	798,795
1985 ^e	75	718	52,903,246	65,998,875	15,325	372,045	142	80.0	1.3	108	1,064,184
1986 ^e	88	992	76,499,123	97,984,539	13,750	543,744	141	73.7	1.3	109.5	1,378,533
1987 ^e	103	1,038	81,307,659	101,903,388	19,386	616,113	132	84.0	1.2	108.9	978,449
1988 ^e	171	1,285	105,716,337	135,354,637	38,765	776,907	136	71.2	1.3	109.5	3,260,020
1989 ^e	168	1,341	112,618,881	149,455,848	43,607	663,442	170	85.2	1.3	111.2	1,844,682
1990 ^e	189	1,565	128,977,638	161,821,350	46,440	911,613	141	97.4	1.3	109.1	1,796,664
1991 ^e	220	2,788	265,123,960	328,647,269	76,056	1,391,583	191	95.1	1.2	110.2	3,464,036
1992	250	2,763	227,376,582	315,302,034	77,858	1,281,796	177	97.6	1.4	111.7	2,325,852
1993	254	1,836	169,558,842	230,787,000	65,081	971,046	175	92.5	1.4	111.6	1,573,952
1994	273	1,293	114,779,014	149,775,765	54,837	716,524	160	93.1	1.3	110.4	1,799,323
1995	253	869	60,611,411	75,252,677	53,707	506,802	117	89.6	1.2	108.6	1,287,169
1996	234	766	52,912,823	65,712,797	50,169	520,651	102	75.8	1.2	107.5	1,333,014
1997	226	1,127	99,975,539	119,543,024	47,036	754,140	133	96.5	1.2	107.3	2,351,555
1998 ^f	229	1,767	186,543,734	243,341,381	47,909	891,268	207	97.0	1.3	111.1	2,893,945
1999 ^f	241	1,630	143,296,568	184,529,821	50,173	899,043	158	97.7	1.3	110.3	1,828,313

^aDeadloss included.

^cPartial district and subdistrict closures, see Table 5-26.

^bIncludes Tanner crab gear prior to 1992.

^fOpen access fishery only.

^cDefined as catch of legal crabs per pot pull.

^dSoutheastern and Pribilof subdistricts only 1978 to 1987.

Table 5-24. Economic performance of the Bering Sea commercial snow crab fishery, 1979/80-1999.

Year	GHL ^a	Exvessel Value	Season	
			Total ^b	Length ^c
1979/80	N/A	\$0.21	\$82.50	307
1981	39.5-91.0	\$0.26	\$13.10	229
1982	16.0-22.0	\$0.73	\$20.70	167
1983 ^d	15.8	\$0.35	\$8.70	120
1984 ^d	49	\$0.30	\$7.80	320
1985 ^d	98	\$0.30	\$19.50	333
1986 ^d	57	\$0.60	\$60.00	252
1987 ^d	56.4	\$0.75	\$75.70	158
1988 ^d	110.7	\$0.77	\$100.70	120
1989 ^d	132	\$0.75	\$110.70	112
1990 ^d	139.8	\$0.64	\$102.30	148
1991 ^d	315	\$0.50	\$162.60	159
1992	333	\$0.50	\$156.50	97
1993	207.2	\$0.75	\$171.90	59
1994	105.8	\$1.30	\$192.40	45
1995	55.7	\$2.43	\$180.00	33
1996	50.7	\$1.33	\$85.60	45
1997	117.0	\$0.79	\$92.60	65
1998 ^e	225.9 ^f	\$0.56	\$134.65	64
1999 ^e	186.2 ^f	\$0.88	\$160.78	66

^aMillions of pounds.

^bMillions of dollars.

^cIn days.

^dPartial district and subdistrict closures, see Table 5-25.

^eOpen access fishery only.

^fOpen access fishery GHL.

Table 5-25. Historical Bering Sea snow crab season dates and area closures.

Season	Opened	Closed	Comments
1977/78	09/15/77	09/23/78	Bering Sea District closure ^a
1978/79	11/01/78	09/03/79	Bering Sea District closure ^a
1979/80	11/01/79	08/15/80 09/03/80	Bering Sea District state closure Bering Sea District federal closure
1981	01/15/81	09/01/81	Bering Sea District closure ^b
1982	02/15/82	08/01/82	Bering Sea District closure ^b
1983	02/15/83	05/22/83 08/01/83	Bering Sea District closure south of 57°30' N. lat. ^b Bering Sea District closure north of 57°30' N. lat. ^b
1984	02/15/84 09/15/84	08/01/84 08/22/84 12/31/84	Bering Sea District closure south of 58° N. lat. ^b Bering Sea District closure north of 58° N. lat. to allow an orderly start to king crab season ^b Bering Sea District closure north of 58°N. lat. reopened after king season and Bering Sea District ^b
1985	1/15/85 10/9/85	05/08/85 08/01/85 08/22/85 12/31/85*	Pribilof Subdistrict closure south of 58° N. lat. ^b Bering Sea District closure south of 58°39' N. lat. ^b Northern Subdistrict closure to allow an orderly start to king crab season ^b Bering Sea District reopened, except east of 164° W. long. in Southeastern Subdistrict, *fishery was scheduled to close 12/31/85 but did not, it remained open through the 1/15/86 start date for 1986 fishery
1986	01/15/86	04/21/86 06/01/86 08/01/86 08/24/86	Southeastern Subdistrict closure west of 164° W long. ^b Pribilof Subdistrict closure ^b Northern Subdistrict closure east of 175° W. long. ^b Northern Subdistrict closure west of 175° W. long. ^b
1987	01/15/87	04/12/87 06/01/87 06/22/87	Southeastern Subdistrict west of 164° W. long., and Pribilof Subdistrict closure Northern Subdistrict south of 60°30' N lat. & east of 178° W. long. closure Northern Subdistrict north of 60°30' N lat. & west of 178° W. long. closure

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Table 5-25. (Page 2 of 2)

Season	Opened	Closed	Comments
1988	01/15/88 05/15/88	03/29/88 06/30/88	Bering Sea District closure (Western Subdistrict to assist in an orderly closure) Western Subdistrict reopened and Western Subdistrict closure
1989	01/15/89	03/26/89 05/07/89	Eastern Subdistrict closure Western Subdistrict closure
1990	01/15/90	04/09/90 04/24/90 06/12/90	Eastern Subdistrict east of 165° W. long. closure Eastern Subdistrict west of 165° W. long. closure Western Subdistrict closure
1991	01/15/91	05/05/91 06/23/91	Eastern Subdistrict closure Western Subdistrict closure
1992	01/15/92	04/22/92	Bering Sea District closure
1993	01/15/93	03/15/93	Bering Sea District closure
1994	01/15/94	03/01/94	Bering Sea District closure
1995	01/15/95	02/17/95	Bering Sea District closure
1996	01/15/96	02/29/96	Bering Sea District closure
1997	01/15/97	03/21/97	Bering Sea District closure
1998	01/15/98	03/20/98	Bering Sea District closure
1999	01/15/99	03/22/99	Bering Sea District closure

^aState managed domestic fishery.^bConcurrent state and federal date.

Table 5-26. Bering Sea commercial snow crab harvest by season and subdistrict, 1977/78-1999.

Season	Subdistrict	Number of			Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
		Vessels	Landings	Crab ^a			Weight (pounds)	CPUE ^b	
1977/78	Southeastern		33	1,063,872	1,439,959	11,560	1.4	92	0
	Pribilof		5	203,674	276,165	1,687	1.4	121	
	TOTAL	15	38	1,267,546	1,716,124	13,247	1.4	96	0
1978/79	Southeastern	101	476	21,279,794	31,102,832	184,491	1.5	115	659,137
	Pribilof	10	14	838,704	1,084,039	6,225	1.5	135	100,000
	TOTAL	102	490	22,118,498	32,187,039	190,746	1.5	116	759,137
1979/80	Southeastern	133	561	23,199,446	36,406,391	237,375	1.6	98	187,945
	Pribilof	19	36	2,087,331	3,166,777	17,727	1.5	118	40,400
	TOTAL	134	597	25,286,777	39,572,668	255,102	1.6	99	228,345
1981	Southeastern		624	24,498,642	37,866,229	309,304	1.6	79	1,475,078
	Pribilof		243	9,916,617	14,886,705	126,438	1.5	78	794,901
	TOTAL	153	867	34,415,322	52,750,034	435,742	1.5	79	2,269,979
1982	Southeastern		468	10,207,174	13,079,583	257,193	1.3	40	422,979
	Pribilof		335	13,882,388	16,276,421	211,898	1.2	66	669,676
	TOTAL	122	803	24,089,562	29,355,374	469,091	1.2	51	1,092,655
1983	Southeastern		153	3,553,281	4,197,304	94,470	1.2	38	165,298
	Pribilof		239	19,076,553	20,514,000	153,458	1	124	1,078,643
	Northern		69	1,223,813	1,417,106	39,199	1.1	31	80,525
	TOTAL	109	461	23,853,647	26,128,410	287,127	1.1	83	1,324,466
1984	Southeastern		76	3,534,370	3,990,621	33,091	1.1	107	54,678
	Pribilof		230	17,909,096	19,727,493	112,078	1.1	160	708,706
	Northern		61	2,566,469	3,094,960	28,422	1.2	90	35,411
	TOTAL	52	367	24,009,935	26,813,074	173,591	1.1	138	798,795

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Table 5-26. (page 2 of 4)

Season	Subdistrict	Number of			Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
		Vessels	Landings	Crab ^a			Weight (pounds)	CPUE ^b	
1985	Southeastern	55	301	21,963,882	27,373,232	158,819	1.4	138	461,001
	Pribilof	60	301	24,089,526	29,804,093	142,937	1.2	169	505,146
	Northern	24	116	6,849,838	8,821,550	70,289	1.3	97	98,037
	TOTAL	75	718	52,903,246	65,998,875	372,045	1.3	142	1,064,184
1986	Southeastern	47	112	8,491,694	10,957,578	63,889	1.3	133	44,755
	Pribilof	80	508	39,851,767	50,525,150	281,337	1.3	142	472,342
	Northern	67	372	28,155,662	36,501,811	198,518	1.3	142	861,436
	TOTAL	88	992	76,499,123	97,984,539	543,744	1.3	141	1,378,533
1987	Southeastern	28	64	4,116,778	5,106,473	24,619	1.2	167	24,619
	Pribilof	94	458	38,604,802	47,676,734	261,337	1.2	148	261,337
	Northern	99	516	38,586,079	49,120,181	330,157	1.2	117	330,157
	TOTAL	103	1,038	81,307,659	101,903,388	616,113	1.2	132	978,449
1988	Eastern	162	770	59,811,702	75,781,258	431,310	1.3	139	775,104
	Western	151	515	45,904,635	58,278,927	335,597	1.3	137	2,484,916
	TOTAL	171	1,285	105,716,337	134,060,185	776,907	1.3	136	3,260,020
1989	Eastern	163	871	77,698,698	104,399,693	391,451	1.3	198	1,128,971
	Western	127	470	34,920,183	45,056,155	271,991	1.3	128	715,711
	TOTAL	168	1,341	112,618,881	149,455,848	663,442	1.3	170	1,844,682
1990	Eastern	177	956	76,331,829	94,831,897	512,259	1.2	149	1,010,755
	Western	152	659	52,645,809	66,989,453	399,354	1.3	132	785,909
	TOTAL	189	1,565	128,977,638	161,821,350	911,613	1.3	141	1,796,664

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Table 5-26. (page 3 of 4)

Season	Subdistrict	Number of			Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
		Vessels	Landings	Crab ^a			Weight (pounds)	CPUE ^b	
1991	Eastern	218	2,013	190,139,612	240,090,666	912,751	1.3	208	1,593,021
	Western	186	867	74,984,348	88,556,603	478,832	1.2	157	1,871,015
	TOTAL	220	2,788	265,123,960	328,647,269	1,391,583	1.2	191	3,464,036
1992	Eastern	250	N/A	217,375,564	302,363,005	1,228,280	1.4	177	2,268,467
	Western	55	N/A	10,001,018	12,939,029	53,516	1.3	187	57,385
	TOTAL	250	2,763	227,376,582	315,302,034	1,281,796	1.4	177	2,325,852
1993	Eastern	251	1,384	110,760,099	151,328,721	675,996	1.4	164	1,108,520
	Western	185	633	58,798,743	79,458,279	295,050	1.4	199	465,432
	TOTAL	254	1,836	169,558,842	230,787,000	971,046	1.4	175	1,573,952
1994	Eastern	220	820	56,012,017	72,008,424	375,928	1.3	149	901,674
	Western	171	586	58,766,997	77,767,341	340,596	1.3	173	897,649
	TOTAL	273	1,293	114,779,014	149,775,765	716,524	1.3	160	1,799,323
1995	Eastern	217	627	32,630,348	39,736,986	313,910	1.2	104	657,051
	Western	153	357	27,981,063	35,515,691	192,892	1.3	145	630,118
	TOTAL	253	869	60,611,411	75,252,677	506,802	1.2	120	1,287,169
1996	Eastern	161	462	23,676,069	28,244,924	252,227	1.2	94	555,118
	Western	146	351	29,236,754	37,467,873	268,424	1.3	109	777,896
	TOTAL	234	766	52,912,823	65,712,797	520,651	1.2	102	1,333,014
1997	Eastern	225	1,040	88,486,602	105,648,771	649,319	1.2	136	2,115,217
	Western	83	164	11,488,937	13,894,253	104,821	1.2	110	236,338
	TOTAL	226	1,127	99,975,539	119,543,024	754,140	1.2	133	2,351,555

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Table 5-26. (page 4 of 4)

Season	Subdistrict	Number of			Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
		Vessels	Landings	Crab ^a			Weight (pounds)	CPUE ^b	
1998 ^c	Eastern	228	1,724	177,781,444	232,485,209	855,393	1.3	205	2,787,292
	Western	44	88	8,762,290	10,856,172	35,875	1.2	242	106,653
	TOTAL	229	1,767	186,543,734	243,341,381	891,268	1.3	207	2,893,945
1999 ^c	Eastern	236	1,386	102,209,222	134,135,696	656,276	1.3	156	1,237,770
	Western	121	388	39,646,982	48,565,812	242,767	1.2	163	590,543
	TOTAL	241	1,630	141,856,204	182,701,508	899,043	1.3	158	1,828,313

^aDeadloss included.

^bDefined as catch of legal crab per pot.

^cOpen access fishery only.

Table 5-27. Bering Sea commercial snow crab catch by statistical area, 1999.

Area	Number of		Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
	Landings	Crab ^a			CPUE ^b	Weight (pounds)	
EASTERN SUBDISTRICT AREAS							
655500	6	323,571	477,042	2,552	127	1.47	3,210
655530	4	177,115	272,817	1,303	136	1.54	2,679
655600	4	78,387	113,695	917	86	1.45	1,072
665500	27	1,369,997	2,064,571	12,000	114	1.51	26,262
665530	33	1,012,292	1,503,403	9,733	104	1.49	11,535
665600	26	1,056,219	1,534,539	9,736	109	1.45	18,544
665630	3	193,964	285,288	1,294	150	1.47	2,293
675500	24	1,012,976	1,485,202	6,644	153	1.47	8,994
675530	95	4,553,544	6,565,051	35,074	130	1.44	36,741
675600	132	6,571,128	9,253,748	43,859	150	1.41	80,659
675630	42	2,138,973	2,927,399	12,009	178	1.37	20,005
675700	17	533,587	733,412	4,354	123	1.37	13,554
685530	44	3,086,226	4,424,347	19,762	156	1.43	33,944
685600	179	11,297,519	14,823,348	61,688	183	1.31	133,602
685630	232	12,034,832	15,894,783	69,015	174	1.32	137,673
685700	93	5,400,764	7,259,617	32,506	166	1.34	63,518
685730	30	1,776,099	2,425,384	10,337	172	1.37	21,176
695600	10	316,951	395,056	1,725	184	1.25	4,773
695631	74	3,362,093	4,465,758	20,190	167	1.33	45,959
695632	3	235,247	306,844	1,697	139	1.30	7,043
695700	83	4,687,163	6,172,060	32,016	146	1.32	79,723
695730	10	554,542	703,466	4,070	136	1.27	11,381
705600	10	466,651	570,304	4,115	113	1.22	4,991
705630	14	453,676	584,296	3,289	138	1.29	7,316

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Table 5-27. (Page 2 of 3)

Area	Number of		Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
	Landings	Crab ^a			CPUE ^b	Weight (pounds)	
EASTERN SUBDISTRICT AREAS (Cont.)							
705701	33	1,761,322	2,241,558	12,958	136	1.27	25,900
705730	12	345,940	446,261	2,398	144	1.29	7,090
715600	18	811,313	1,035,082	5,335	152	1.28	19,764
715630	73	4,670,006	5,745,803	24,634	190	1.23	38,368
715700	156	9,512,071	11,928,851	64,683	147	1.25	94,329
715730	48	2,296,140	2,778,027	17,278	133	1.21	25,373
715800	4	73,459	89,445	415	177	1.22	1,694
725600	5	274,258	346,006	1,653	166	1.26	2,902
725630	92	7,493,339	9,091,169	39,815	188	1.21	79,758
725700	101	6,023,371	7,507,735	38,422	157	1.25	65,932
725730	85	5,003,581	6,173,497	33,839	148	1.23	62,852
725800	29	1,115,530	1,324,350	8,515	131	1.19	26,188
725830	6	106,972	125,382	986	109	1.17	1,788
WESTERN SUBDISTRICT AREAS							
735630	9	532,783	653,685	3,217	166	1.23	6,509
735700	61	4,646,320	5,651,898	28,061	166	1.22	45,172
735730	95	7,108,758	8,714,679	40,104	177	1.23	72,058
735800	86	6,516,813	7,950,702	39,652	164	1.22	92,075
735830	39	2,124,295	2,647,654	13,018	163	1.25	24,340
735900	10	646,117	767,995	3,829	169	1.19	10,691
745800	42	2,998,727	3,642,801	16,200	185	1.21	43,652
745830	85	7,152,827	8,852,089	39,265	182	1.24	104,201
745900	26	1,668,425	1,967,728	10,488	159	1.18	68,230
745930	12	812,032	949,644	4,360	186	1.17	8,753

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Table 5-27. (Page 3 of 3)

Area	Number of		Harvest ^a (pounds)	Pots Pulled	Average		Deadloss (pounds)
	Landings	Crab ^a			CPUE ^b	Weight (pounds)	
WESTERN SUBDISTRICT AREAS (Cont.)							
755830	44	2,426,684	2,981,656	16,764	145	1.23	34,656
755900	26	1,144,963	1,393,353	10,854	106	1.22	36,555
755930	6	146,950	184,091	1,985	74	1.25	9,880
765830	7	84,020	109,930	687	122	1.31	460
765930	11	100,970	129,759	1,316	77	1.29	2,738
775830	3	191,081	236,942	1,377	139	1.24	2,809
775900	5	78,760	96,949	498	158	1.23	1,151
775930	18	1,060,024	1,359,538	6,676	159	1.28	22,699
785930	4	190,442	233,436	1,575	121	1.23	1,905
Other ^c	36	1,484,759	1,930,696	8,301	180	1.31	11,194
Total ^d	1630	143,296,568	184,529,821	899,043	159	1.29	1,828,313

^aDeadloss included.^bDefined as catch of legal crabs per pot.^cIncludes 12 statistical areas where less than three vessels made landings.^dOpen access fishery only.

Table 5-28. Bering Sea grooved Tanner crab fishery data, 1992-1999.

Year	Harvest ^a	Number of		Pots Pulled	Exvessel Value	Fishery Value ^b	Average		Deadloss
		Crabs ^a	Vessels				Weight ^c	CPUE	
1992				CONFIDENTIAL					
1993	658,796	342,095	6	35,650	\$0.94	\$0.60	1.9	9	71,000
1994	332,454	165,365	4	13,739	\$1.20	\$0.40	2	11	30,585
1995	1,005,721	38,313	8	60,993	\$1.40	\$1.31	2.1	7	69,177
1996	106,886	40,849	3	14,504	\$1.08	\$0.10	2.1	3	11,186
1997				NO REPORTED LANDINGS					
1998				NO REPORTED LANDINGS					
1999				NO REPORTED LANDINGS					

^aDeadloss included.

^bMillions of dollars.

^cIn pounds.

Table 5-29. Bering Sea triangle Tanner crab fishery data, 1992-1999.

Year	Harvest ^a	Number of		Pots Pulled	Exvessel Value	Fishery Value ^b	Average		Deadloss
		Vessels	Crabs ^a				Weight ^c	CPUE	
1992				NO REPORTED LANDINGS					
1993				NO REPORTED LANDINGS					
1994				NO REPORTED LANDINGS					
1995	49,007	4	41,914	22,180	\$1.35	\$0.05	1.2	1	14,147
1996				CONFIDENTIAL					
1997				NO REPORTED LANDINGS					
1998				NO REPORTED LANDINGS					
1999				NO REPORTED LANDINGS					

^aDeadloss included.

^bMillions of dollars.

^cIn pounds.

Table 5-30. Bering Sea District Korean hair crab fishery data, 1978-1999.

Year	Number of		Crab ^a	Harvest ^{a,b}	Pots		Average		Deadloss ^b
	Vessels	Landings			Registered	Lifted	CPUE ^c	Weight ^b	
1978/79	11	16	2,457	5,213		9,908	<1	2.1	0
1979/80	9	17	25,417	53,914		14,506	2	2.1	0
1980/81	67	192	1,127,309	2,439,483		172,695	7	2.2	265,369
1981/82	48	159	466,560	932,584		117,518	4	2.0	29,749
1982/83	52	161	575,453	1,211,420		84,346	7	2.1	122,456
1983/84	19	48	200,670	406,538		20,414	10	2.0	28,062
1984	7	26	197,209	396,630		22,392	9	2.0	19,436
1985	3	9	34,410	66,042		3,905	9	2.0	593
1986	3	7	7,289	14,835		4,720	2	2.0	500
1987	2				CONFIDENTIAL				
1988					NO LANDINGS				
1989					NO LANDINGS				
1990					NO LANDINGS				
1991	7	42	441,533	377,708		44,444	10	.9	0
1992	9	20	203,758	240,767		38,808	5	1.2	11,495
1992	10	47	1,127,948	1,198,590		125,943	9	1.1	65,674
1993	4	5	2,347	3,038		9,345	<1	1.3	0
1993/94	19	129	1,936,795	2,331,686		585,913	3	1.2	124,596
1994	10	55	897,070	1,199,246	13,350	287,954	3	1.3	49,275
1995	21	81	1,485,097	2,059,988	25,750	441,494	3	1.4	73,882

-Continued-

Table 5-30. (Page 2 of 2)

Year	Number of		Crab ^a	Harvest ^{a,b}	Pots		Average		Deadloss ^b
	Vessels	Landings			Registered	Lifted	CPUE ^c	Weight ^b	
1996	19	99	485,735	745,804	20,680	410,548	1	1.5	32,495
1997	16	52	420,121	668,096	18,180	211,970	2	1.6	17,522
1998	12	31	188,784	307,739	14,330	128,495	2	1.6	17,392
1999	8	27	139,894	221,656	9,840	92,333	1	1.6	4,677

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lift.

Table 5-31. Bering Sea Korean hair crab fishery economic performance data, 1978/79-1999.

Year	GHL	Value		Season Length	
		Exvessel ^a	Total ^b	Days	Dates
1978/79		\$0.54	\$0.003	257	04/19-12/31
1979/80		\$0.75	\$0.04	244	01/01-08/30
1980/81		\$0.80	\$1.7	242	11/01-06/30
1981/82		\$0.55	\$0.5	288	11/01-08/15
1982/83		\$0.65	\$0.7	297	10/08-08/01
1983/84		\$1.20	\$0.5	335	08/01-06/30
1984		\$1.60	\$0.6	184	07/01-12/31
1985		\$1.60	\$0.1	365	01/01-12/31
1986		\$1.15	\$0.2	365	01/01-12/31
1987		CONFIDENTIAL		365	01/01-12/31
1988		NO LANDINGS			
1989		NO LANDINGS			
1990		NO LANDINGS			
1991		\$3.08	\$1.2	365	01/01-12/31
1992		\$2.25	\$0.5	32	01/01-06/04
1992		\$2.46	\$2.8	156	10/01-11/01
1993		NA	NA	45	04/01-05/15
1993/94	3	\$2.42	\$5.3	171	11/01-04/20
1994	1.1	\$3.55	\$4.0	41	11/01-12/12
1995	1.8	\$2.87	\$5.7	25	11/01-11/26
1996	0.9	\$2.65	\$1.9	31	11/01-12/02
1997	0.8	\$2.97	\$1.9	25	11/01-11/25
1998	0.4	\$2.70	\$0.8	16	10/8-10/23
1999	0.3	\$3.20	\$0.7	37	10/30-12/7

^a Price per pound.

^b In millions of dollars.

Table 5-32. Bering Sea Korean hair crab catch by statistical area, 1999.

Statistical area	Number of		Harvest ^{a,b}	Pots lifted	Average		
	Landings	Crab ^a			CPUE ^c	Weight ^b	Deadloss ^b
695631	3	813	1,462	2,090	<1	1.8	38
695700	19	83,788	128,849	60,381	1	1.5	3,118
705630	1	172	312	380	<1	1.8	3
705701	14	55,121	91,033	29,482	2	1.7	1,518

^aDeadloss included.

^bIn pounds.

^cNumber of legal crabs per pot lift.

Table 5-33. Bering Sea octopus and *P. multispina* catch statistics by season, 1996-1999.

Year	Fishery	Number of		Number of Pots		Harvest ^c
		Vessels	Landings	Registered	Pulled	
1995	Octopus	10	15	2,273	19,154	9,307
	<i>Paralomis multispina</i>	1		NO REPORTED HARVEST		
1996	Octopus	9		NA ^a	NA ^a	27,115
	<i>Paralomis multispina</i>	1		CONFIDENTIAL		
1997	Octopus	19	8 ^b	NA ^a	NA ^a	1,107
	<i>Paralomis multispina</i>			NO REPORTED HARVEST		
1998	Octopus	14	48 ^b	NA ^a	NA ^a	4,324
	<i>Paralomis multispina</i>			NO REPORTED HARVEST		
1999	Octopus	25	61 ^b	NA	NA	6,694
	<i>Paralomis multispina</i>					

^aHistoric data unavailable in some years.

^bAll landings incidental to other fisheries.

^cDeadloss Included

Table 5-34. Bering Sea snail catch statistics by season, 1992 - 1999.

Year	Number of		Number of Pots		Harvest ^c	CPUE	Pounds per Pot ^b	Deadloss
	Vessels	Landings	Registered	Pulled				
1992					CONFIDENTIAL			
1993	4	10	13,800	44,686	312,876	25.01	7	NA ^a
1994	4	42	14,850	279,349	2,027,328	21.34	7.26	62,571
1995	4	38	18,800	262,096	2,352,825	28.05	8.98	22,371
1996	5	67	31,300	741,326	3,572,992	16.07	4.82	62,494
1997	3	17	14,500	191,893	932,048	15.67	4.86	77,131
1998					NO REPORTED LANDINGS			
1999					NO REPORTED LANDINGS			

^aHistoric data unavailable in some years.

^bWhole weight.

^cDeadloss Included

Table 5-35. Bering Sea snail fishery statistics, 1992-1999.

Year	Season Total ^a	Number of		Value	
		Vessels	Landings	Exvessel	Total
1992		CONFIDENTIAL			
1993	312,876	4	10	\$0.40	\$125,150
1994	1,964,757	4	42	\$0.34	\$668,017
1995	2,330,454	4	38	\$0.30	\$699,136
1996	3,510,498	5	67	\$0.30	\$1,053,149
1997	854,917	3	17	\$0.36	\$307,770
1998		NO REPORTED HARVEST			
1999		NO REPORTED HARVEST			

^aWeight in pounds

Table 5-36. North Peninsula District Dungeness crab fishery statistics, 1992-1999.

Year	Harvest ^a	Number of		Pots Pulled	Value		Average		Deadloss
		Crabs ^a	Vessels		Exvessel	Total ^b	Weight ^c	CPUE	
1992				NO REPORTED HARVEST					
1993				CONFIDENTIAL					
1994				CONFIDENTIAL					
1995	134,407	63,732	6	34,499	\$1.32	\$0.18	2.1	4	367
1996			1	CONFIDENTIAL					
1997			2	CONFIDENTIAL					
1998			1	CONFIDENTIAL					
1999				NO REPORTED HARVEST					

^aDeadloss included.

^bMillions of dollars.

^cIn pounds.

Table 5-37. The crab Community Development Quota (CDQ) Program percent allocation by group.

Fishery	Group ¹					
	APICDA	BBEDC	CBSFA	CVRF	NSEDC	YDFDA
Bristol Bay red king	20	20	0	20	20	20
Pribilof red & blue king	0	0	100	0	0	0
St. Matthew blue king	50	12	0	12	14	12
Norton Sound red king	0	0	0	0	50	50
Bering Sea Snow Crab	10	19	19	17	18	17
Bering Sea Tanner Crab	10	19	19	17	18	17

¹APICDA (Aleutian Pribilof Island Community Development Association).

BBEDC (Bristol Bay Economic Development Corporation).

CBSFA (Central Bering Sea Fishermen's Association).

CVRF (Coastal Villages Region Fund).

NSEDC (Norton Sound Economic Development Corporation).

YDFDA (Yukon Delta Fisheries Development Association).

Table 5-38. The crab Community Development Quota (CDQ) Program fisheries statistics.

Fishery	Number of			GHL ^{1,2}	Harvest ^{2,3}	Deadloss ²	Pot Pulls ⁴	CPUE ⁵	Average Weight ²
	Vessels	Landings	Crab						
1998 Bristol Bay red king	7	15	74,592	525,115	524,338	391	3,256	23	7.0
1999 Bristol Bay red king	10	12	85,996	580,641	579,258	310	2,976	29	6.7
1998 Pribilof red king ⁶	1	5	3,394	35,958	33,973	2,725	624	5	10.0
1999 Pribilof red king				No Fishery					
1998 Pribilof blue king ⁶	1	4	221		1,730	-	589	<1	7.8
1999 Pribilof blue king				No Fishery					
1998 St. Matthew blue king	2	10	22,630	99,512	98,918	447	2,326	10	4.3
1999 St. Matthew blue king				No Fishery					
1998 Bering Sea Snow Crab	20	86	6,975,242	8,886,634	8,846,977	134,898	39,575	174	1.3
1999 Bering Sea Snow Crab	23	104	7,747,876	9,674,326	9,670,084	92,871	46,490	165	1.2
1998 Bering Sea Tanner Crab				No Fishery					
1999 Bering Sea Tanner Crab				No Fishery					
1998 Totals	20	120	7,076,079	9,547,219	9,505,934	138,461	45,851		
1999 Totals	25	116	7,833,872	10,254,967	10,249,342	93,181	49,466		

¹Guideline Harvest Level.

²In Pounds.

³Includes deadloss.

⁴Pribilof pot pull total was 624.

⁵Defined as catch per pot pull.

⁶Total GHL for red and blue king crab.

Table 5-39. The crab Community Development Quota (CDQ) Program economic overview.

Fishery	Vessels	Landings	Harvest	\$/lb.	Value ¹	Group ² (Number of Vessels) ³
1998 Bristol Bay red king	7	15	523,947	\$2.45	\$ 1,283,670	51(1); 52(2); 54(1); 55(2); 56(1)
1999 Bristol Bay red king	10	12	578,948	\$5.88	\$ 3,406,037	51(4); 52(2); 54(1); 55(1); 56(2)
1998 Pribilof red & blue king	1	9	32,978	\$2.90	\$ 95,636	53(1)
1999 Pribilof red & blue king					No Fishery	
1998 St. Matthew blue king	2	10	98,471	\$1.67	\$ 164,447	51(1); 52, 54, 55, 56(1) ⁴
1999 St. Matthew blue king					No Fishery	
1998 Bering Sea Snow Crab	20	86	8,712,079	\$0.54	\$ 4,704,523	51(3); 52(3); 53(4); 54(3); 55(4); 56(5)
1999 Bering Sea Snow Crab	23	104	9,577,213	\$0.85	\$ 8,140,631	51(3); 52(3); 53(5); 54(5); 55(4); 56(5)
1998 Bering Sea Tanner Crab					No Fishery	
1999 Bering Sea Tanner Crab					No Fishery	
1998 Totals	20	120	9,367,475	\$0.67	\$ 6,248,276	
1999 Totals	25	116	10,156,471	\$1.14	\$ 11,546,668	

¹CDQ group portion estimated at 20 to 30% of fishery value.

²Group 51, Aleutian Pribilof Island Community Development Association.

Group 52, Bristol Bay Economic Development Corporation.

Group 53, Central Bering Sea Fishermen's Association.

Group 54, Coastal Villages Region Fund.

Group 55, Norton Sound Economic Development Corporation.

Group 56, Yukon Delta Fisheries Development Association.

³Two vessels fished for two different groups during the snow crab fishery.

⁴One vessel fished for BBEDC, CVRF, NSEDC & YDFDA.

Table 5-40. Pot limits in the Bering Sea fisheries, 2000.

Fishery	GHL ^a Range (Million Pounds)	Number of Vessels	Pot Limits		Management Type
			Vessels ≤125ft	Vessels >125ft	
Norton Sound Section King Crab ^a			40	50	Not specified
St. Lawrence Island Section King Crab ^a			40	50	Not specified
Pribilof Island Section King Crab ^a			40	50	Not specified
St. Matthew Island Section King Crab ^a			60	75	Not specified
Bering Sea District Tanner Crab ^a			200	250	Not specified
Bristol Bay District King Crab ^b	<4.0	Any	0	0	Season Closed
	4.0 to 5.9	<200	80	100	Inseason
		200-250	60	75	Inseason
		>250	60	75	May pre-announce closure
	6.0 to 8.9	<200	120	150	Inseason
		200-250	100	125	Inseason
		>250	100	125	May pre-announce closure
	9.0 to 12	<200	200	250	Inseason
		200-250	160	200	Inseason
		>250	160	200	May pre-announce closure
	>12	Any	200	250	Inseason

^aPot limits independent of number of vessels registered or GHL.^bMulti-tiered pot limit in effect since 1997.

Table 5-41. Number of Bering Sea buoy tags printed and issued by fishery, 2000.

Fishery	Number of Tags Printed ^a	Number of Tag Sets issued		Total	Number of Tags Issued		Total
		<=125 ^b	>125 ^b		<=125 ^b	>125 ^b	
Pribilof Red and Blue King Crab	6,500						
Pribilof Red and Blue King Crab CDQ ^c	surplus tags						
Pribilof Golden King Crab	surplus tags						
St. Matthew Blue King Crab	10,750						
St. Matthew Blue King Crab CDQ ^c	surplus tags						
Bristol Bay Red King Crab	65,000	181	81	262	27,062	15,740	42,802
Bristol Bay Red King Crab CDQ ^c	surplus tags	7	3	10	1,135	425	1,560
Bering Sea Snow Crab	65,000	158	74	232	29,328	17,857	47,185
Bering Sea Snow Crab CDQ ^c	surplus tags	11	2	13	2,170	310	2,480
Totals	147,250	357	160	517	59,695	34,332	94,027

^aTags were printed in sets of 250 then separated numerically into appropriate sized sets for each fishery.

^bVessel length in feet.

^cCommunity Development Quota.

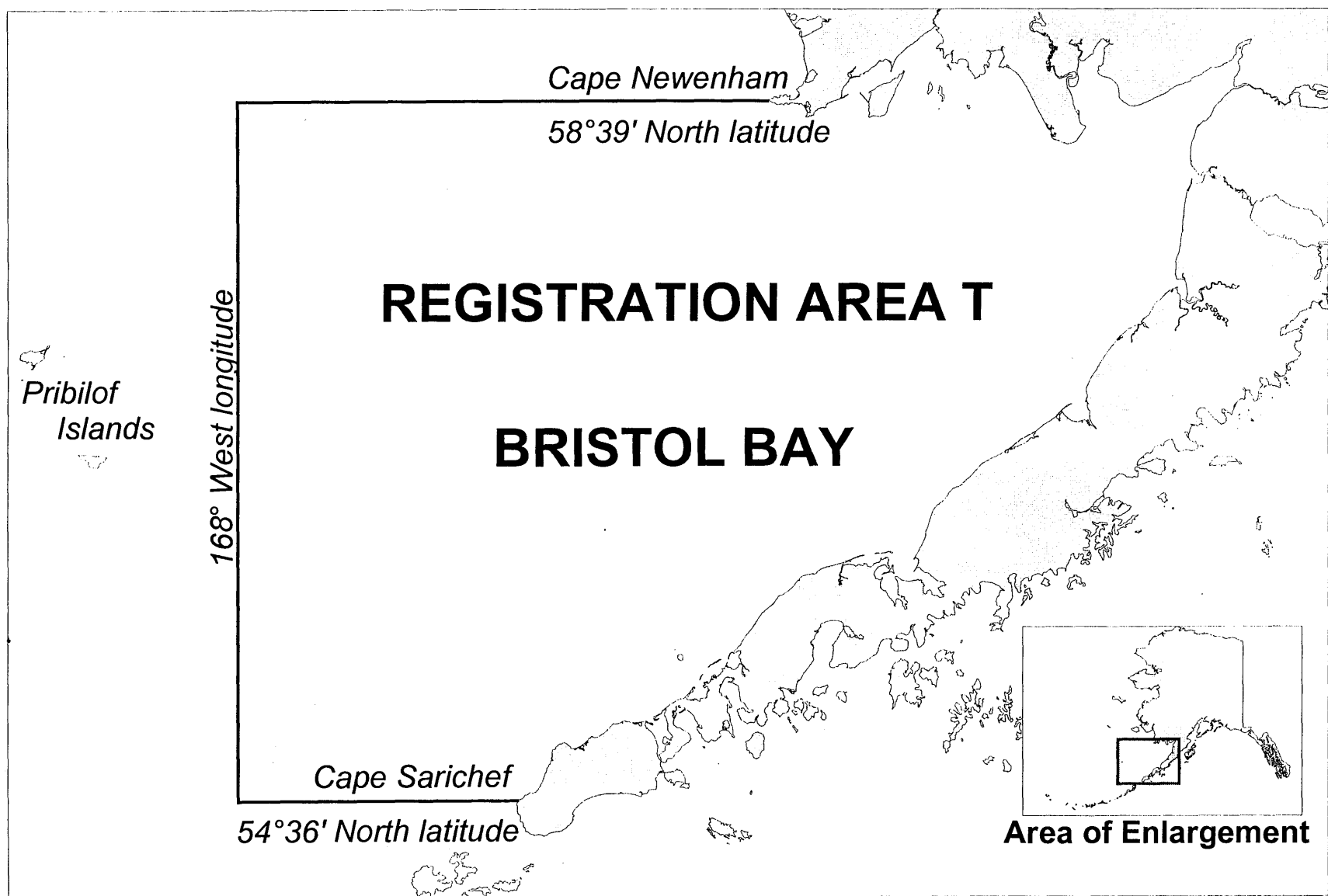


Figure 5-1. Bristol Bay king crab Registration Area T.

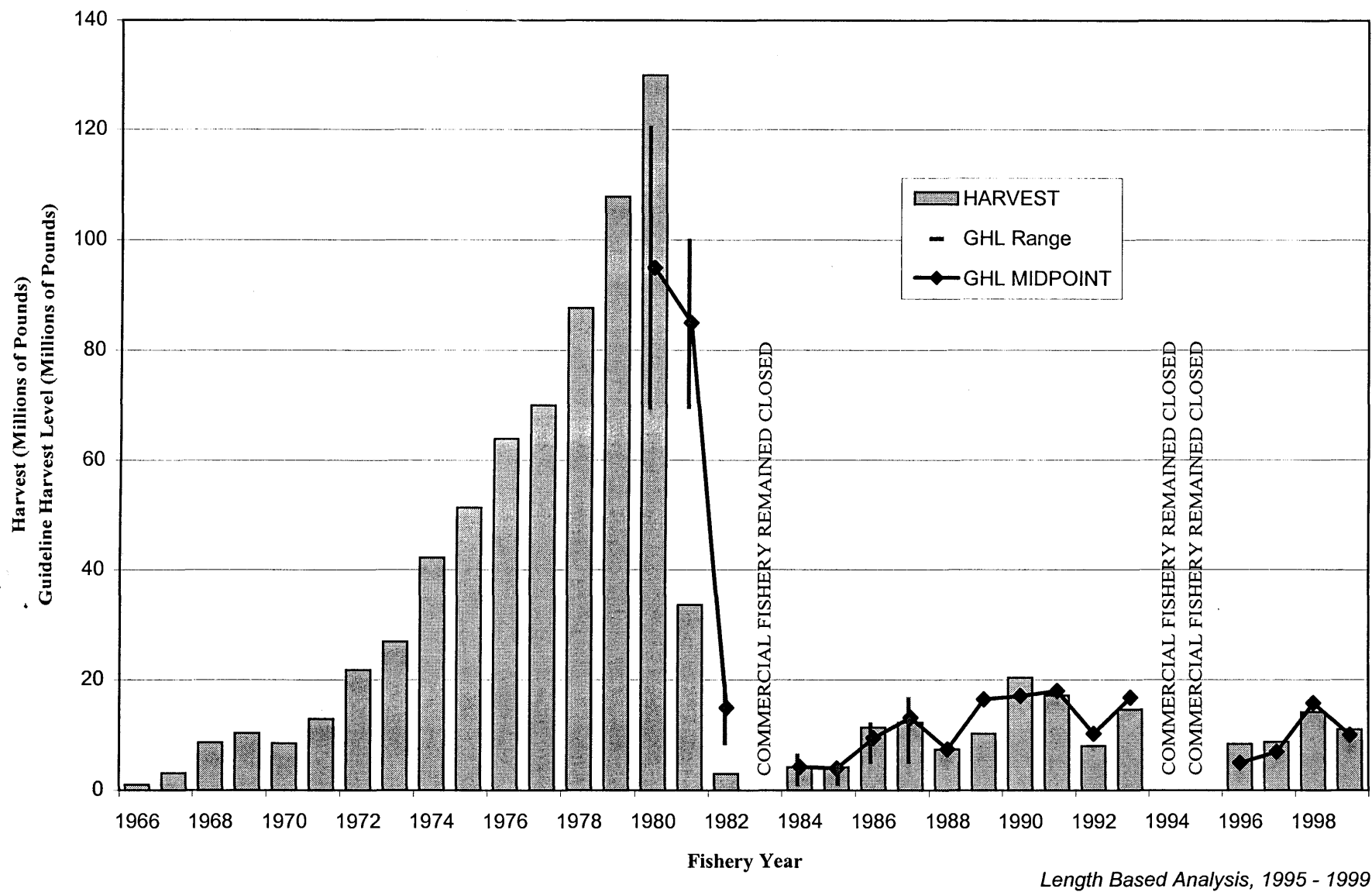


Figure 5- 2. Historic Bristol Bay red king crab harvest and guideline harvest level midpoint, 1966 - 1999.

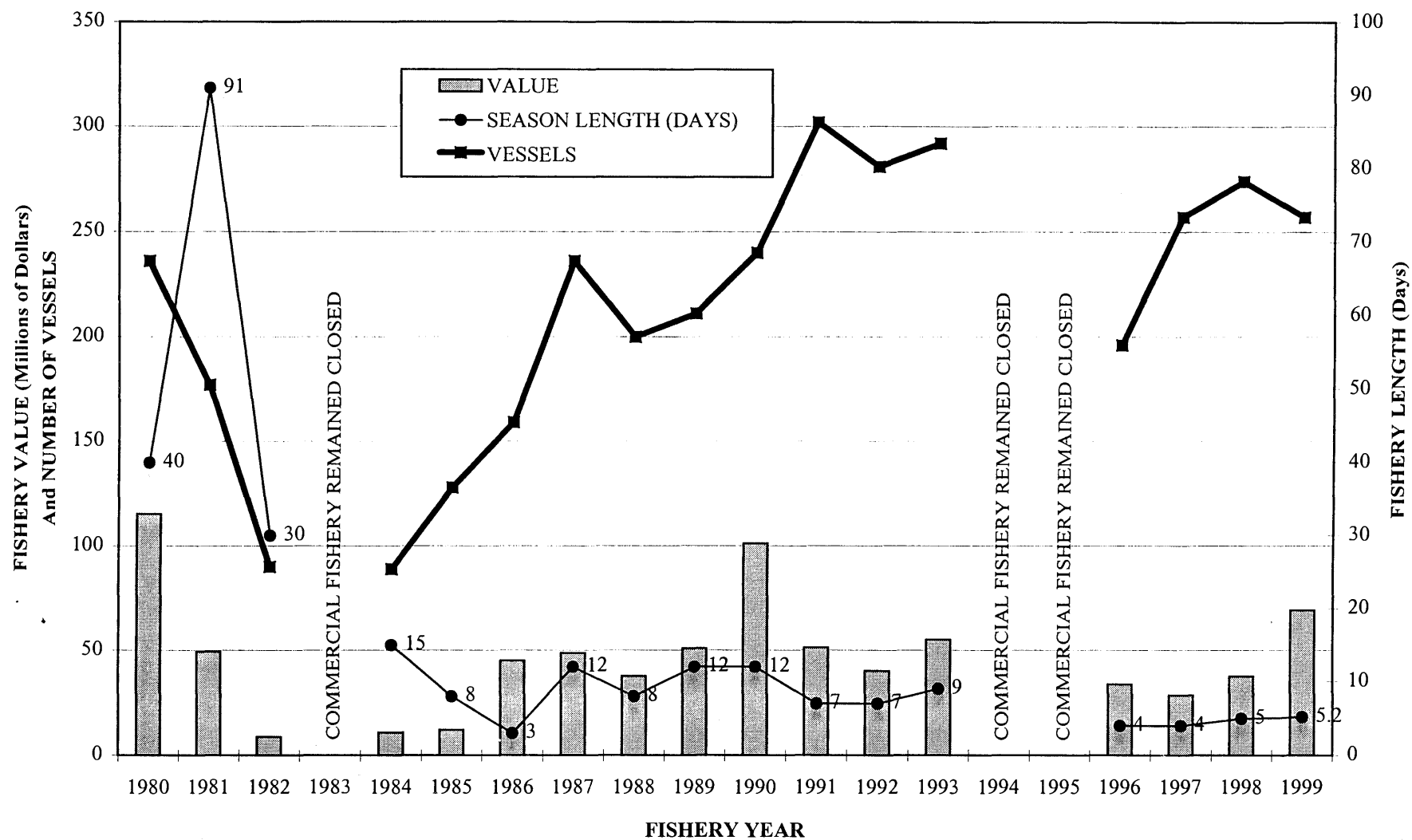


Figure 5- 3. Economic performance of the Bristol Bay red king crab fishery in terms of vessel effort, season length (days), and total fishery value, 1980 - 1999.

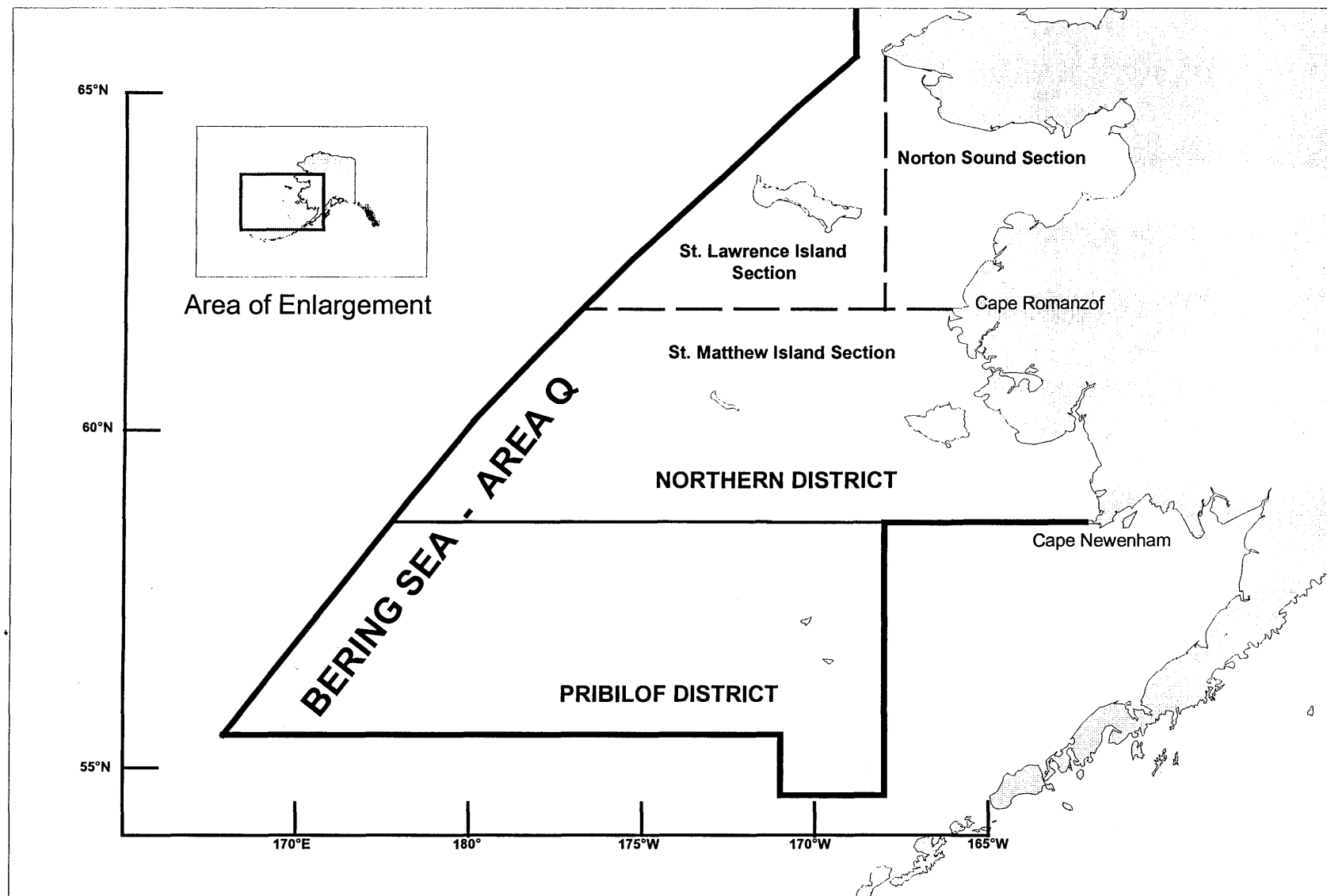


Figure 5-4. Bering Sea king crab Registration Area Q, showing districts and sections.

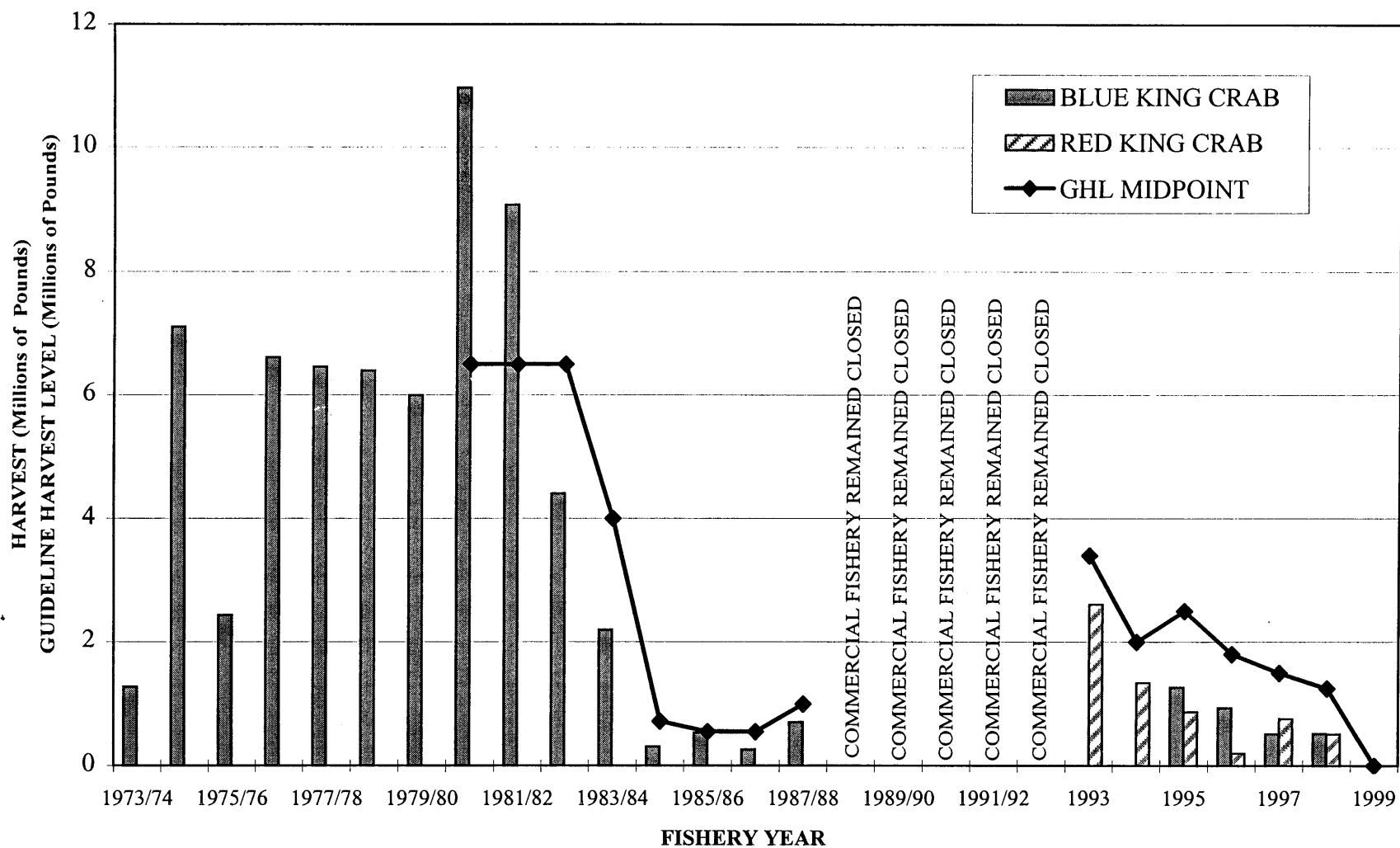


Figure 5-5. Historic red and blue king crab harvest in pounds with guideline harvest level midpoints for the Pribilof District of the Bering Sea, 1973 - 1999.

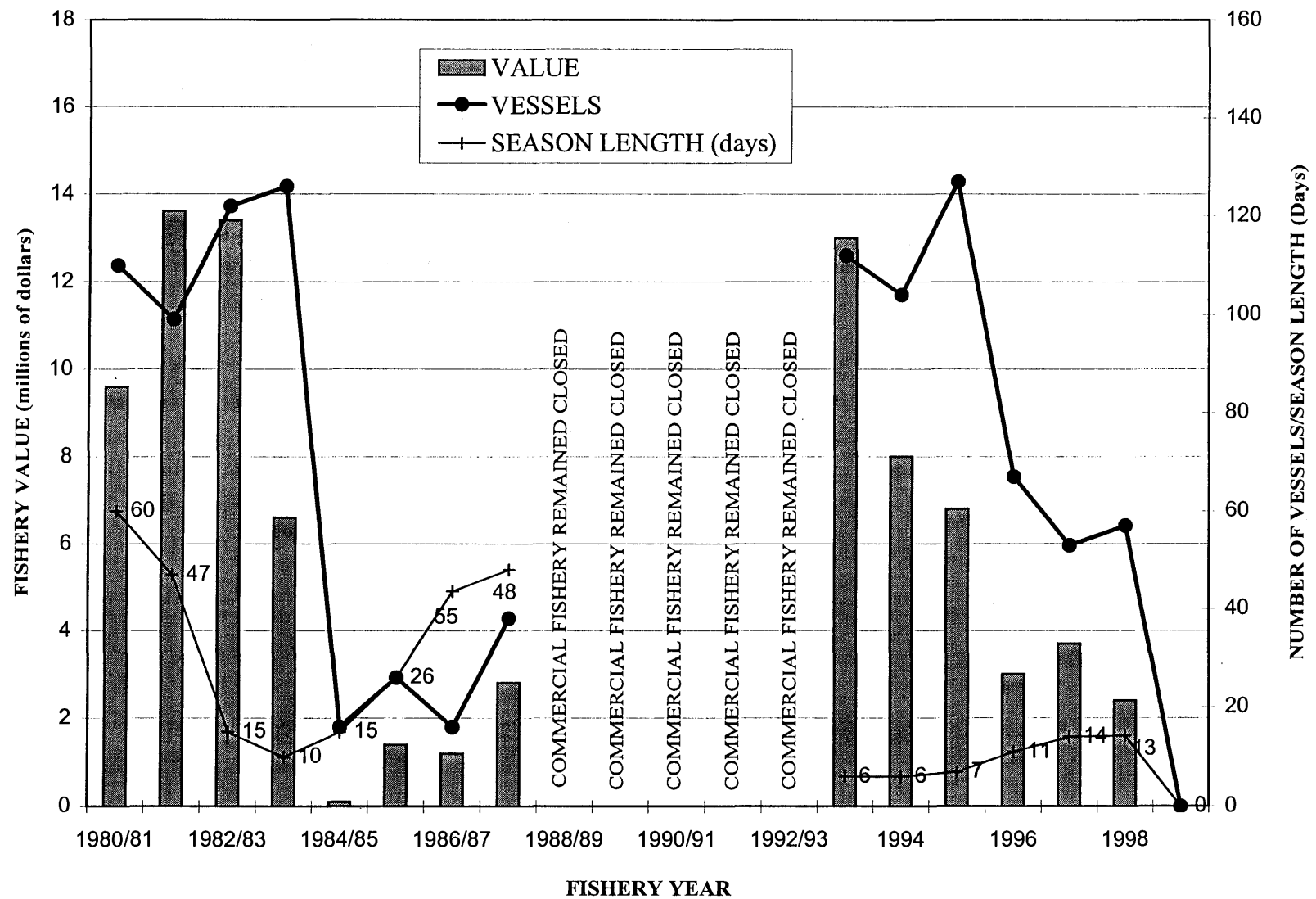


Figure 5-6. Number of vessels, season length, and total fishery value, of the Pribilof District king crab fishery, 1980-1999.

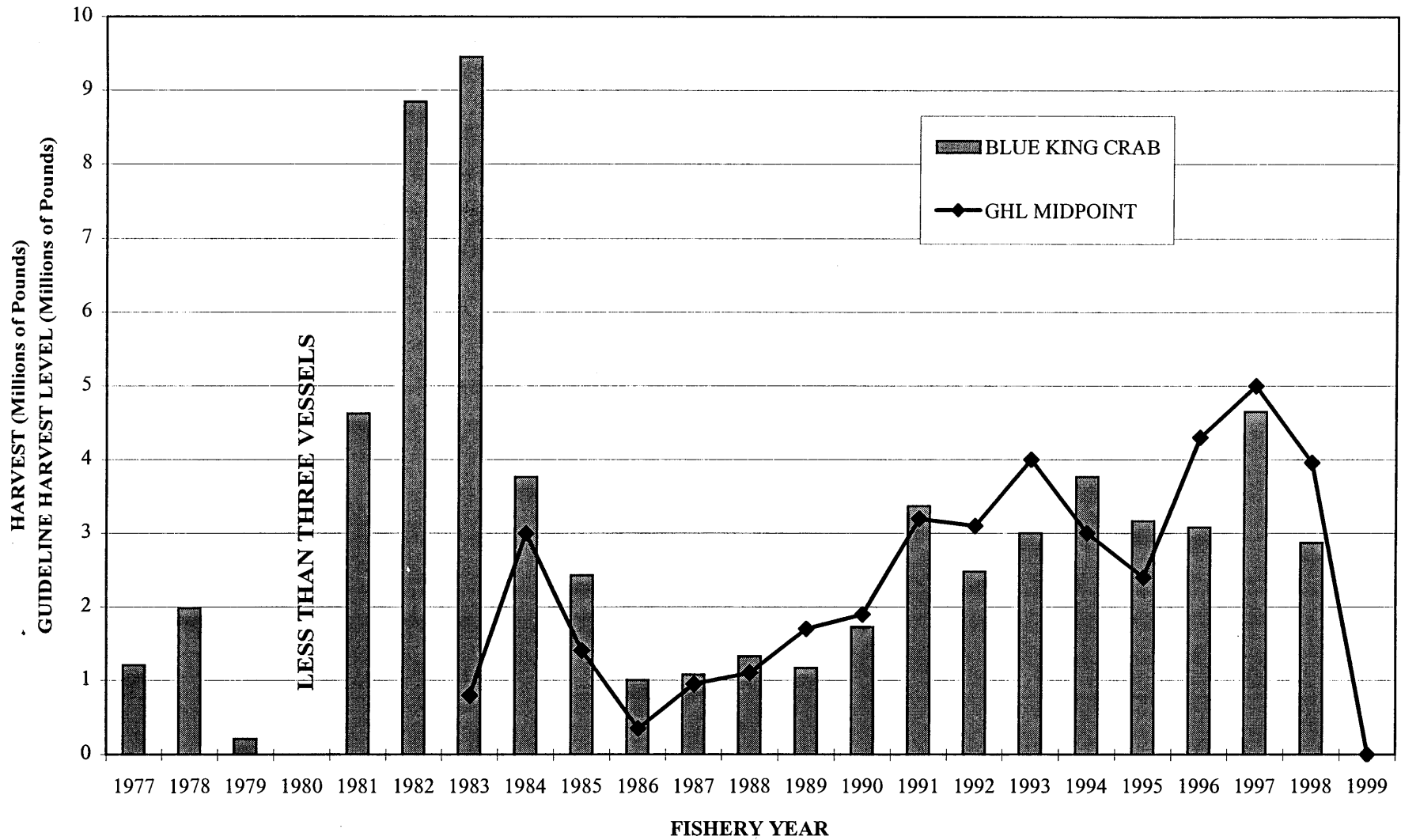


Figure 5-7. Historic blue king crab harvest in millions of pounds with guideline harvest level midpoints for the St. Matthew Island Section of the Northern District of the Bering Sea, 1977 - 1999.

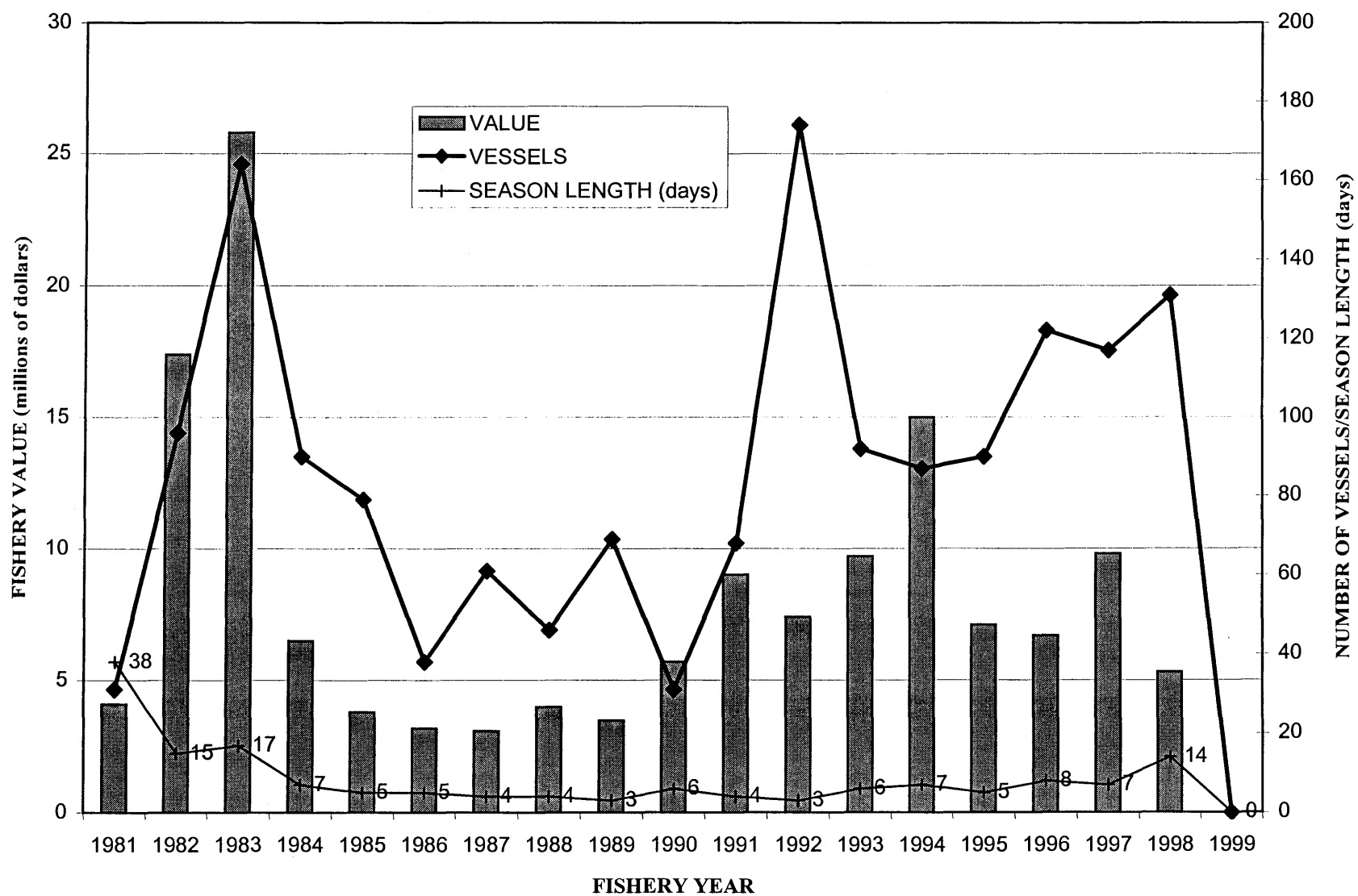


Figure 5-8. Total effort, season length (days) and total fishery value of the St. Matthew Island king crab fishery, 1981 - 1999.

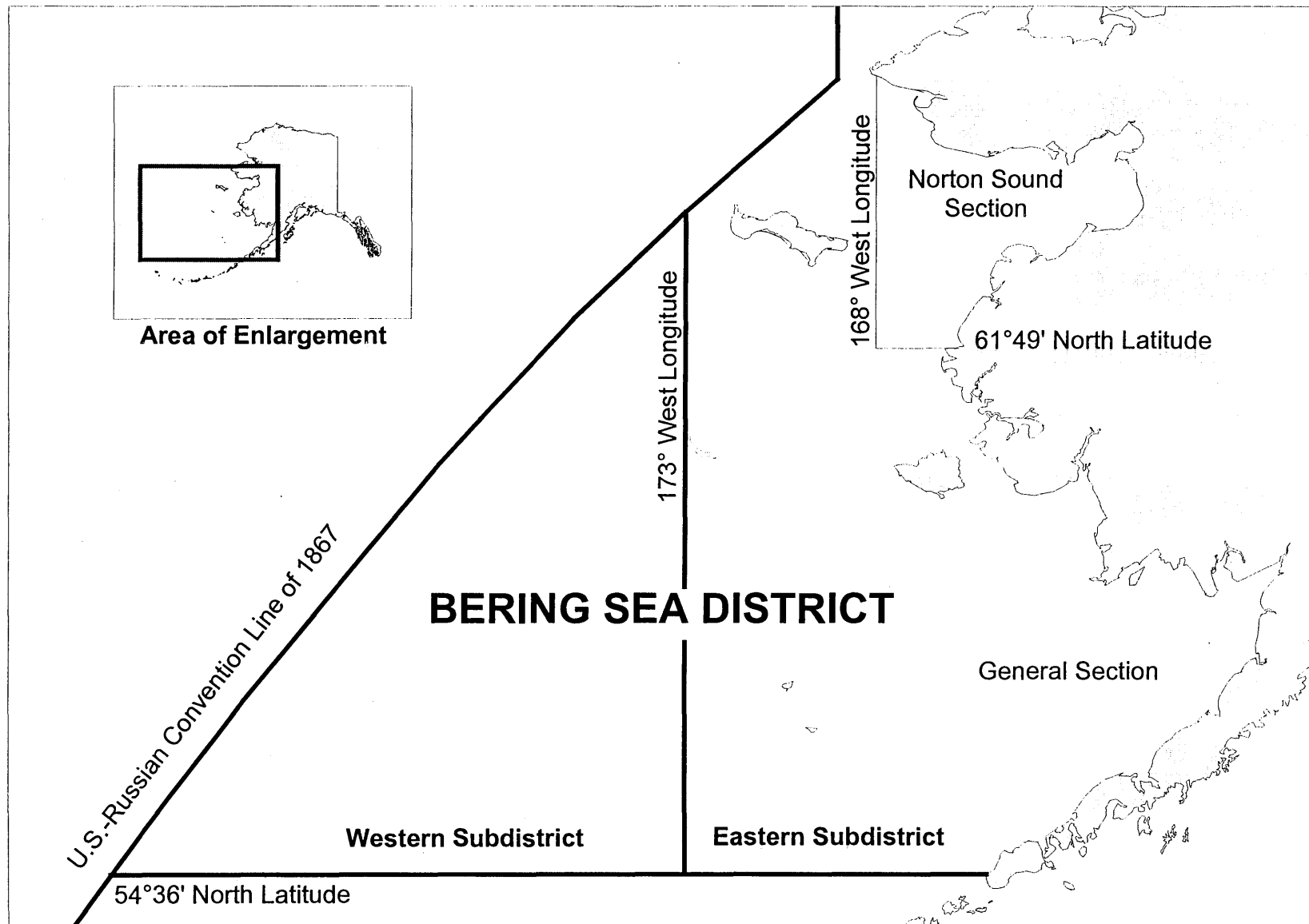


Figure 5-9. Bering Sea District of Tanner crab Registration Area J showing subdistricts and sections.

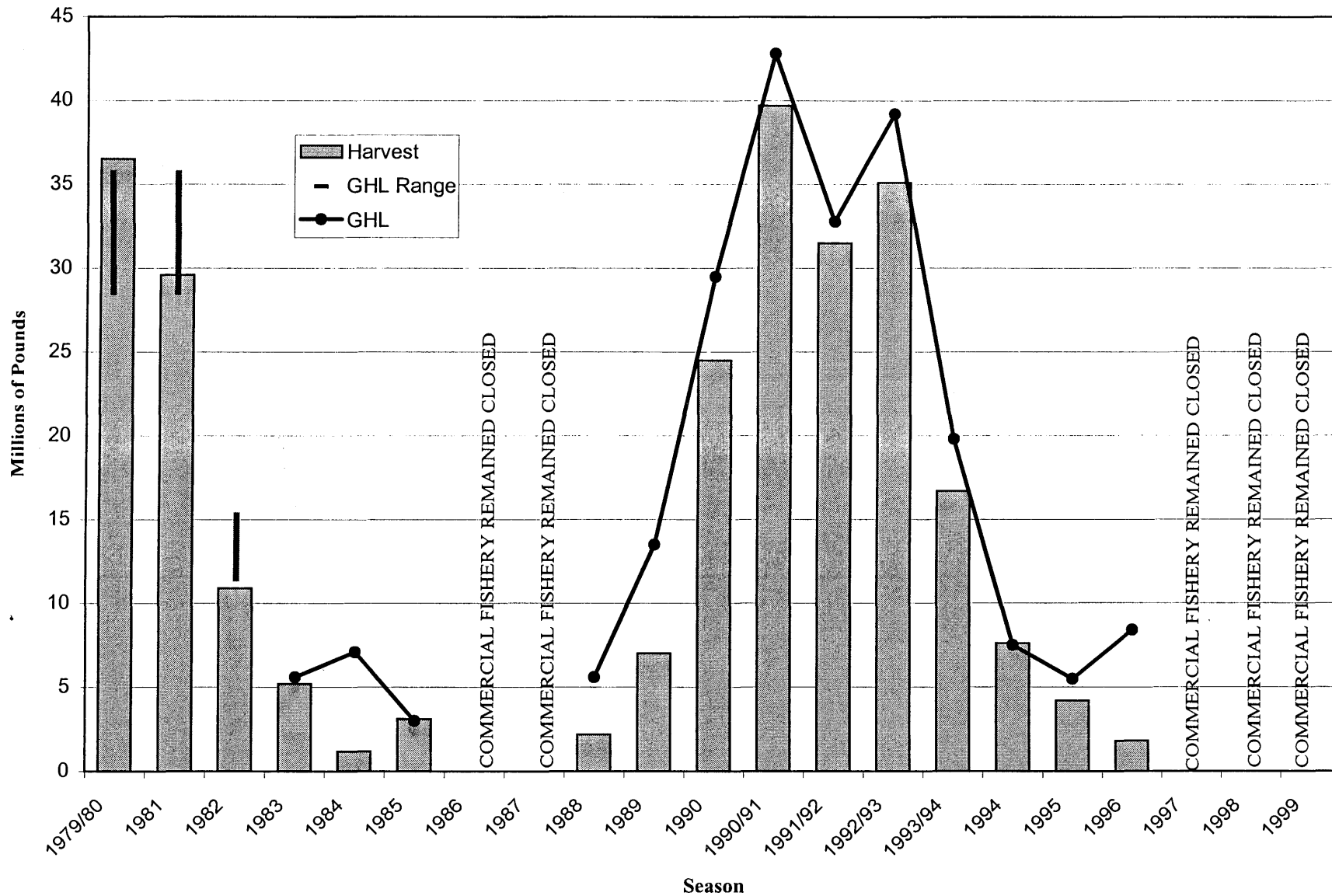


Figure 5-10. Bering Sea Tanner crab harvest and guideline harvest levels, 1979-1999.

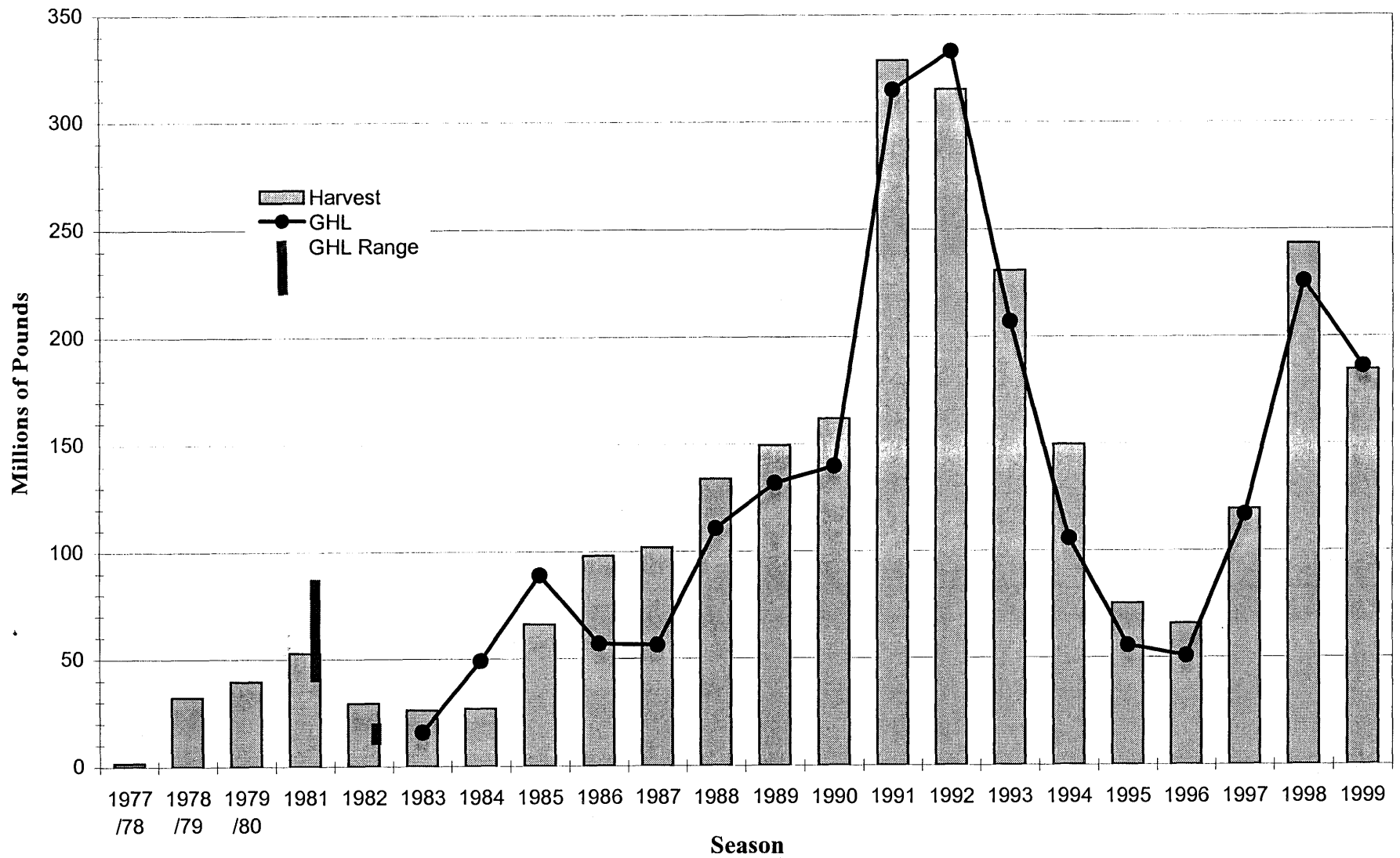


Figure 5-11. Harvest , GHL ranges and GHLs, for the Bering Sea snow crab fishery, 1977-1999.

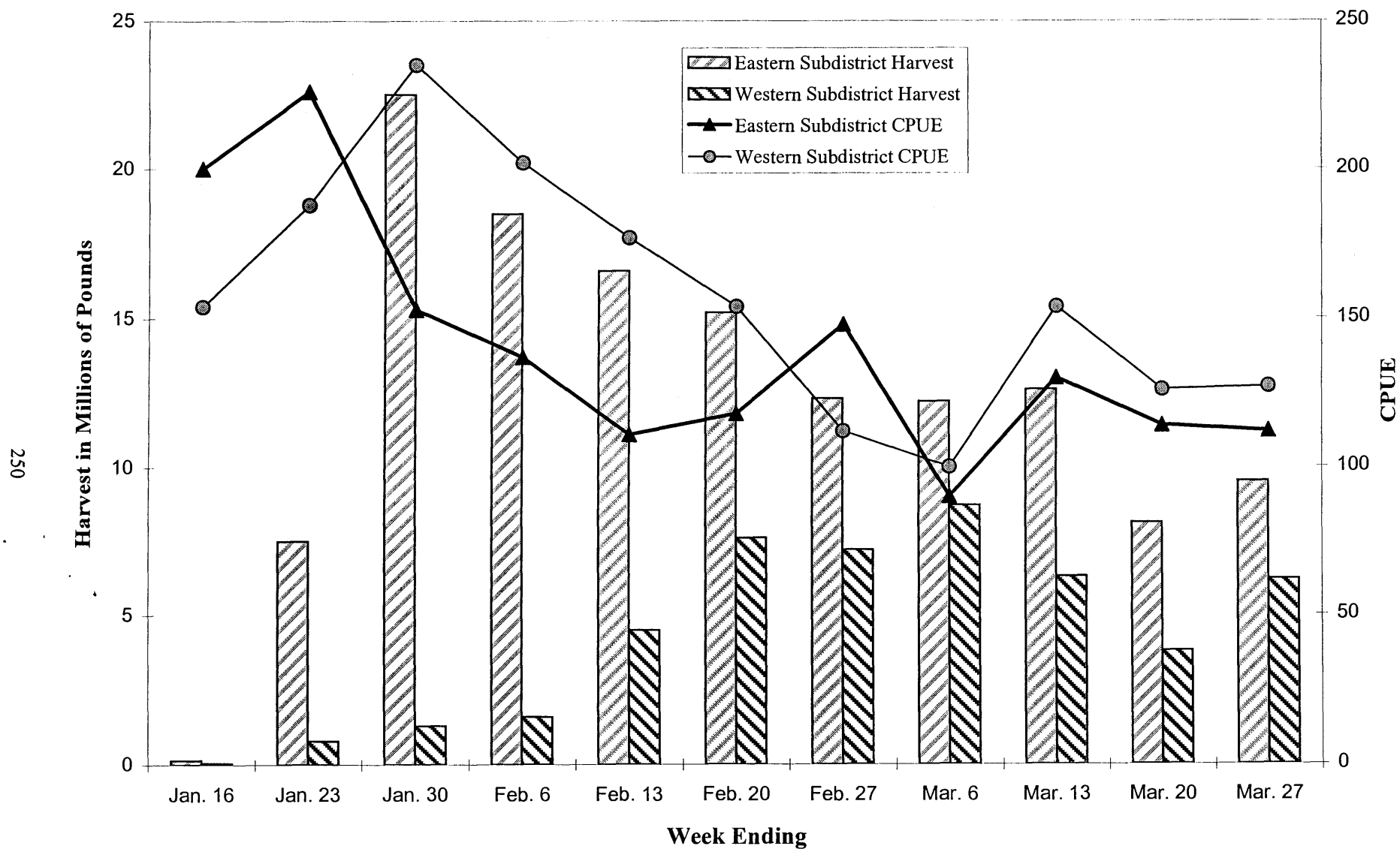


Figure 5-12. Harvest and CPUE, by week, in the 1999 Bering Sea snow crab fishery.

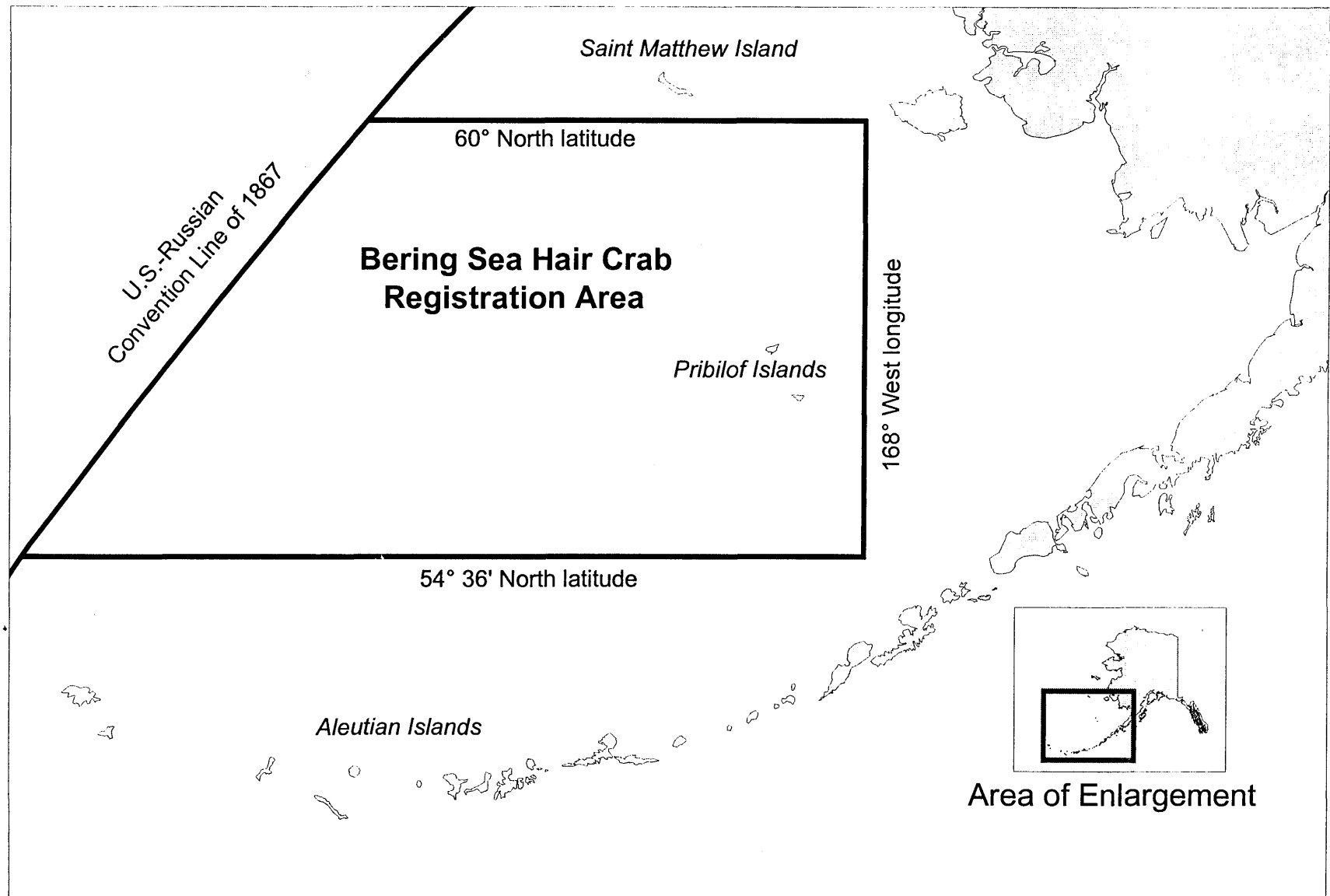


Figure 5-13. Bering Sea hair crab registration area.

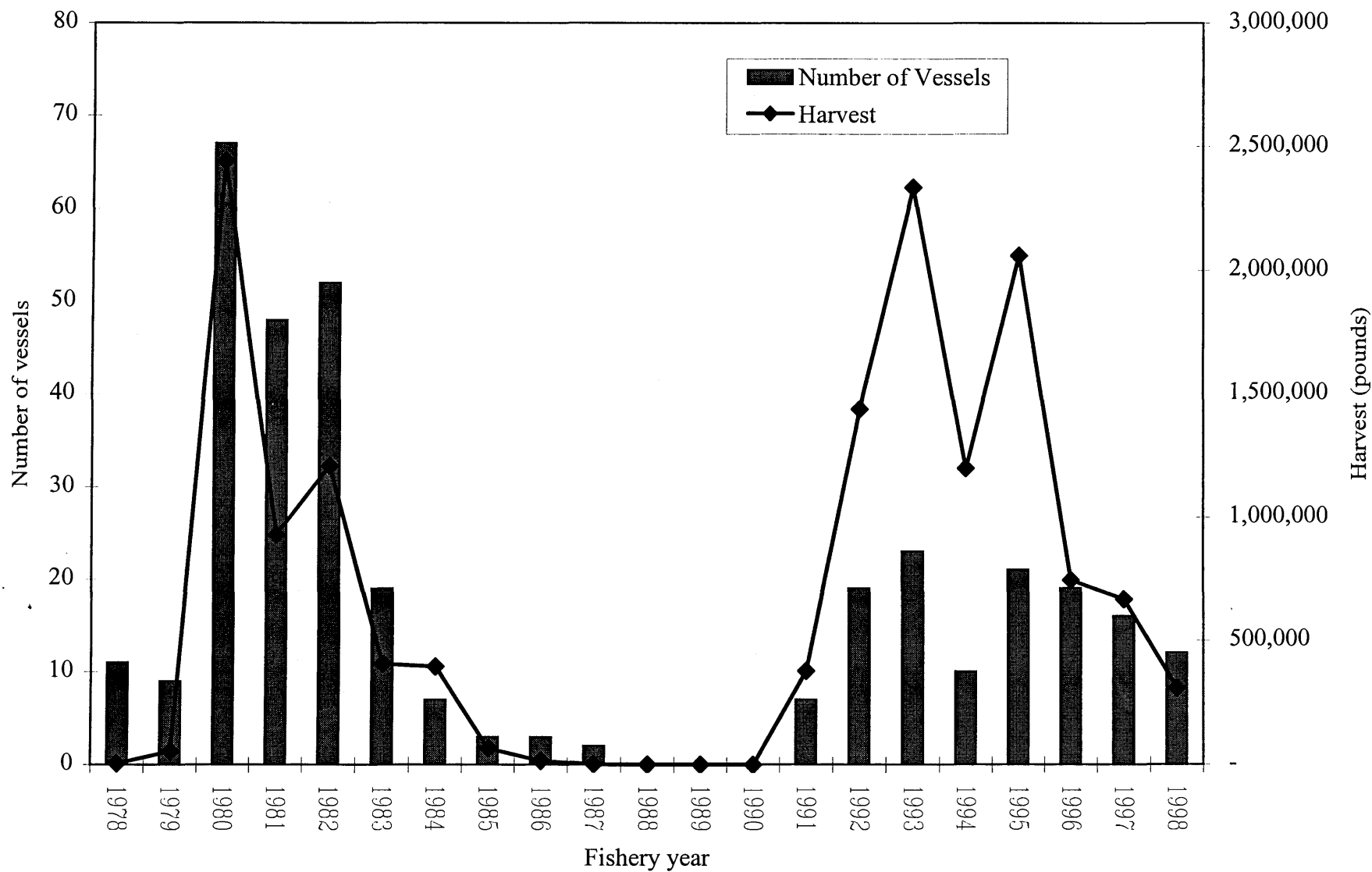


Figure 5-14. Bering Sea Korean hair crab fishery harvest and effort, 1978-1998.

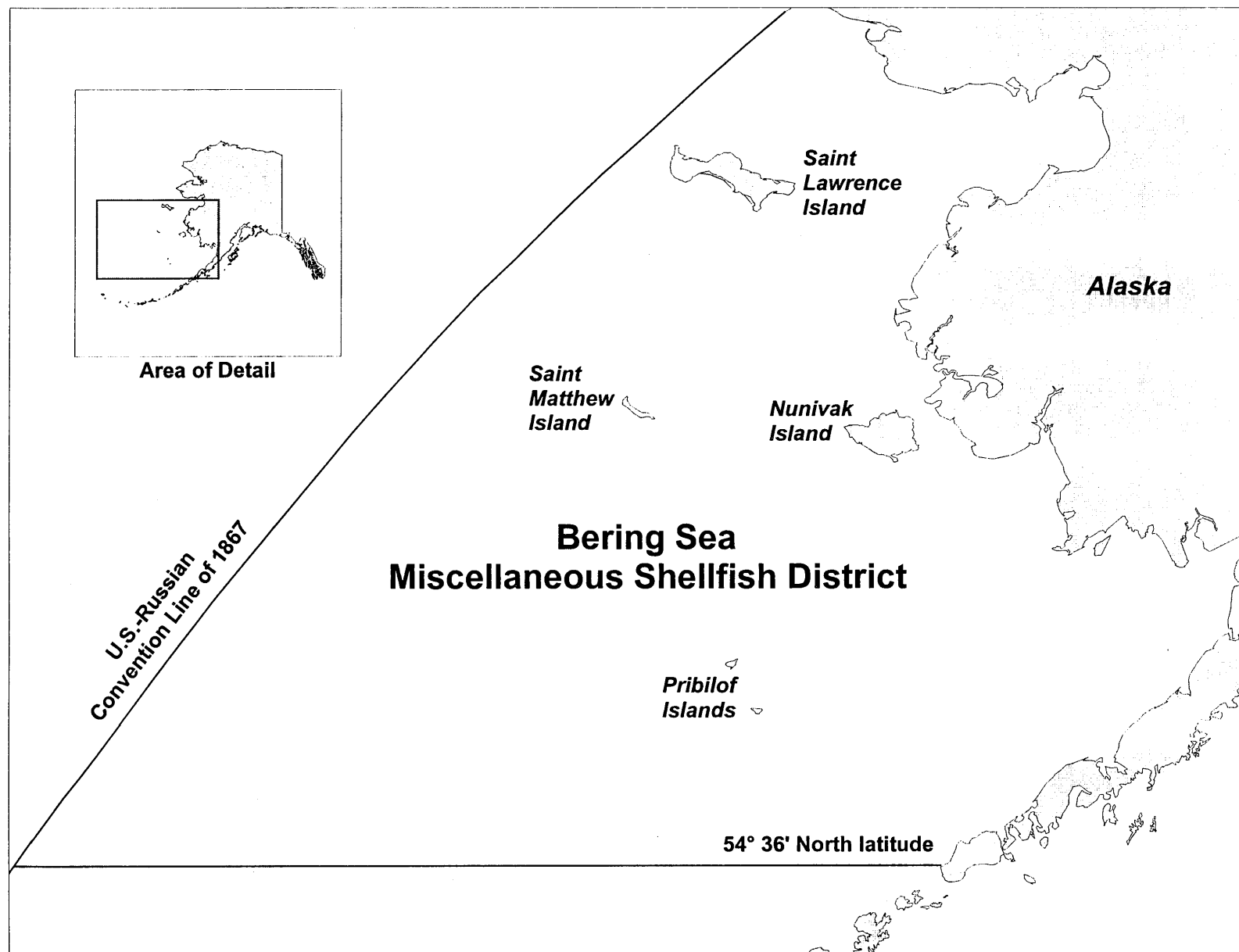


Figure 5-15. Bering Sea District of Miscellaneous Shellfish Registration Area J.

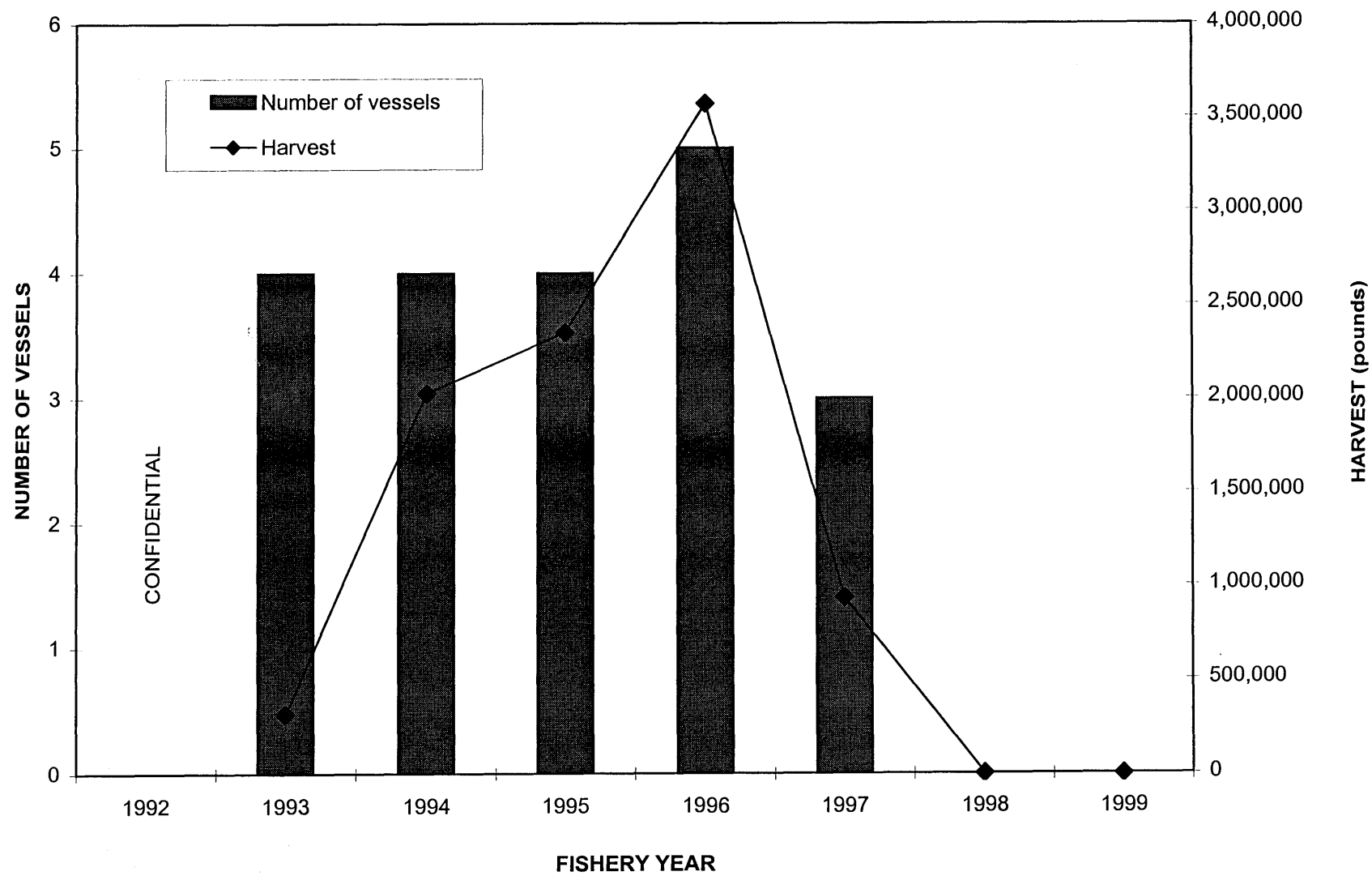


Figure 5-16. Number of vessels and harvest in the Bering Sea snail fishery, 1992-1999.

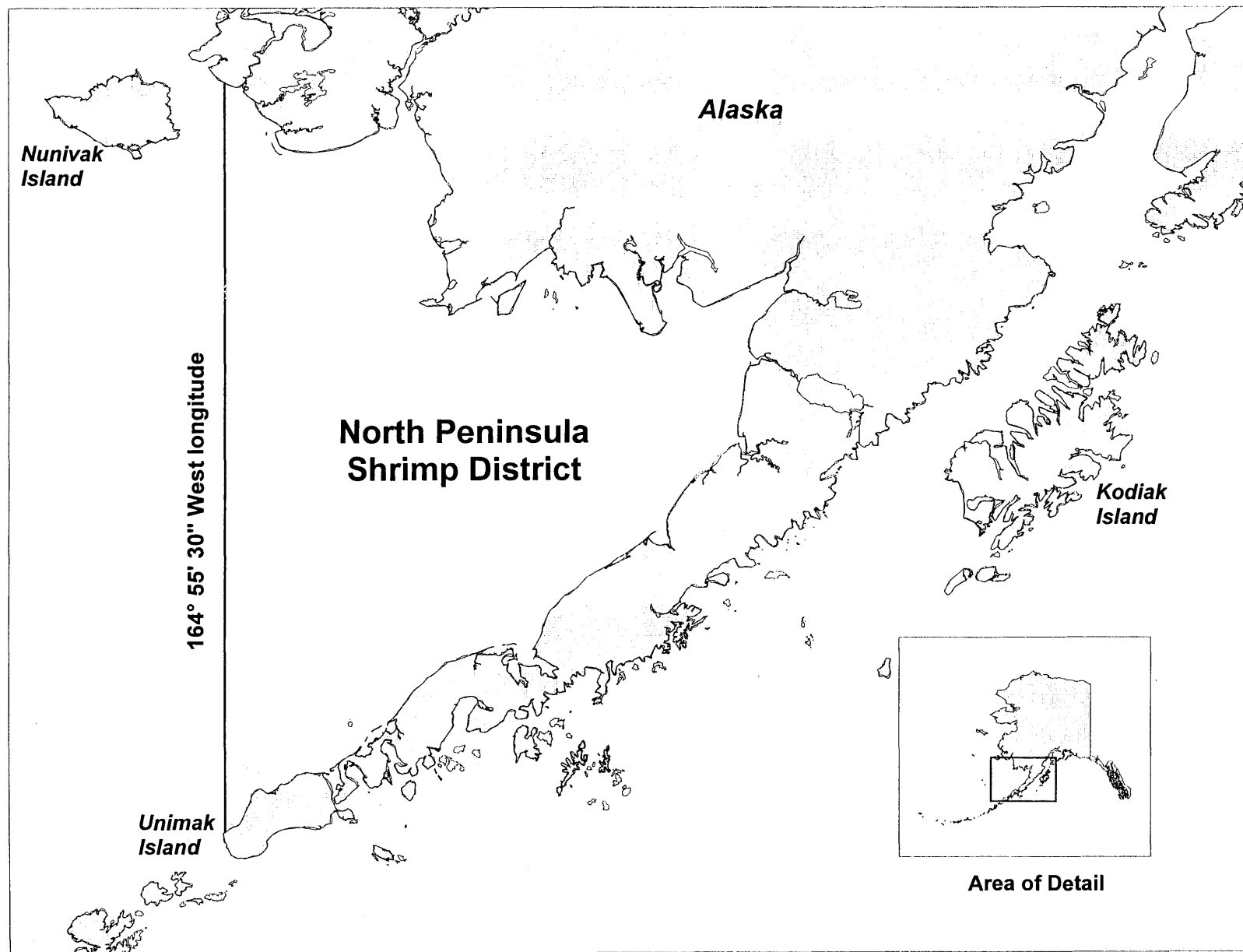


Figure 5-17. The North Peninsula Shrimp Management District of Miscellaneous Shellfish Registration Area J.

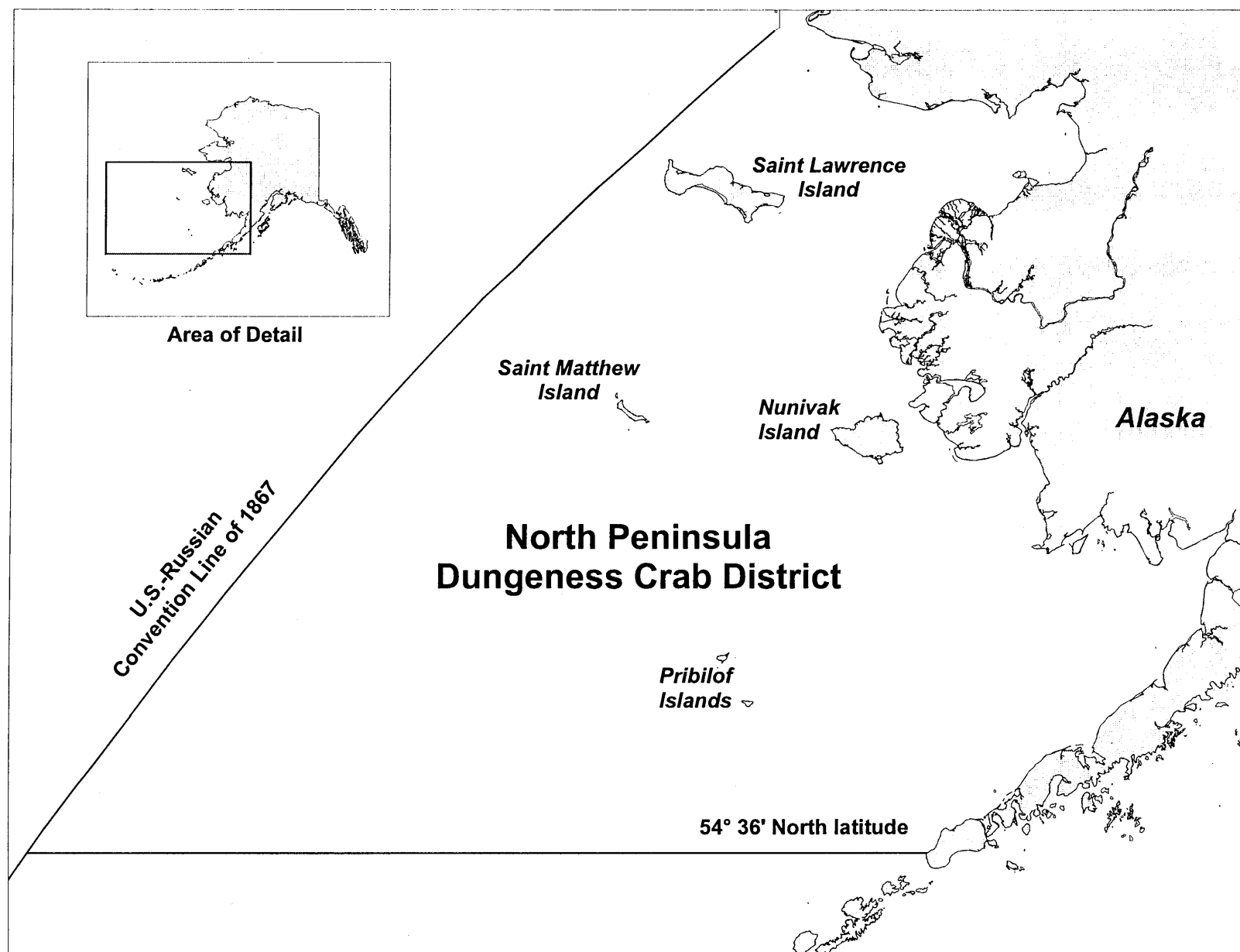


Figure 5-18. North Peninsula Dungeness Management District of Miscellaneous Shellfish Registration Area J.

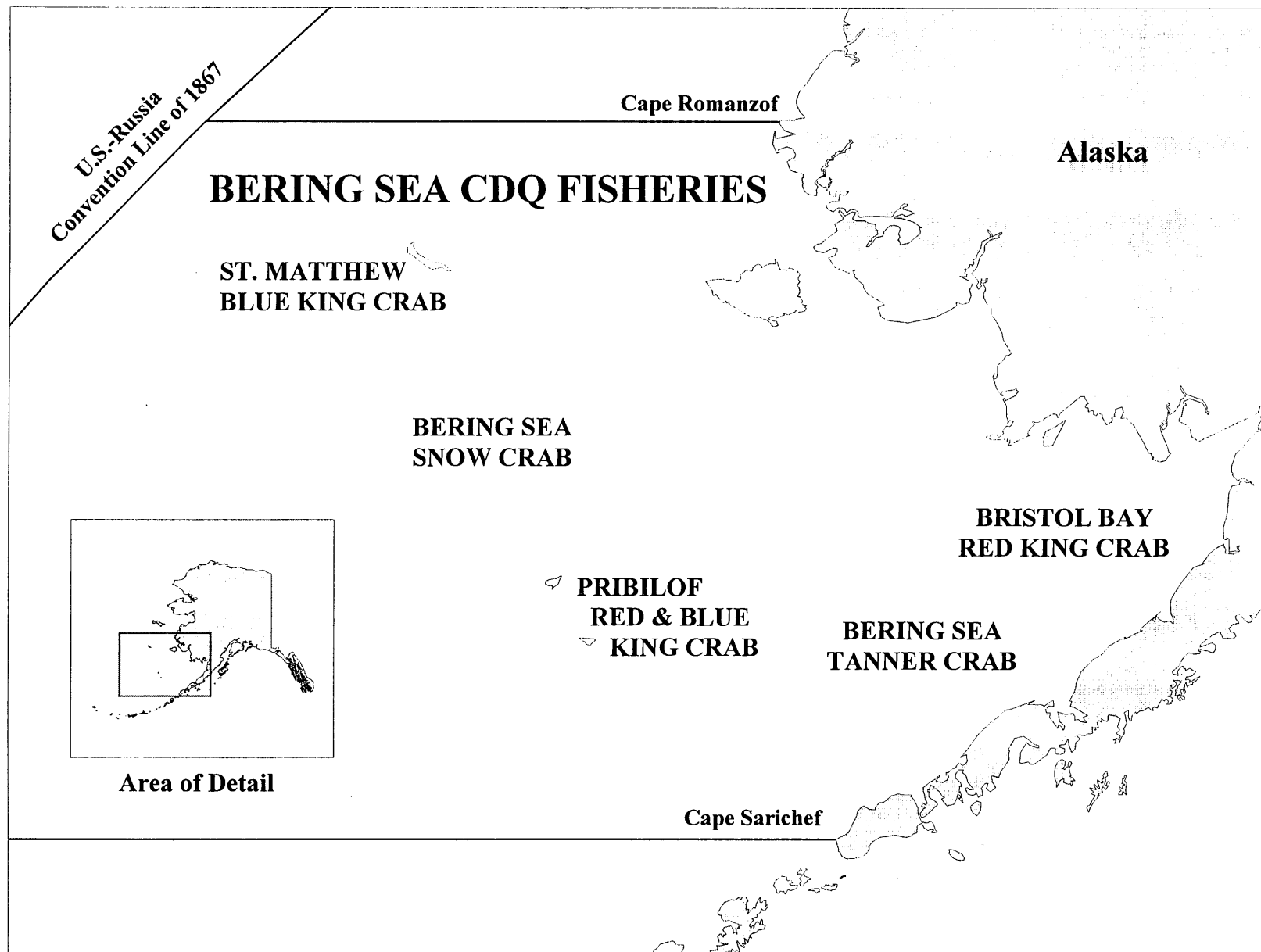


Figure 5-19. Fisheries of the Bering Sea crab Community Development Quota Program managed by the Dutch Harbor staff.

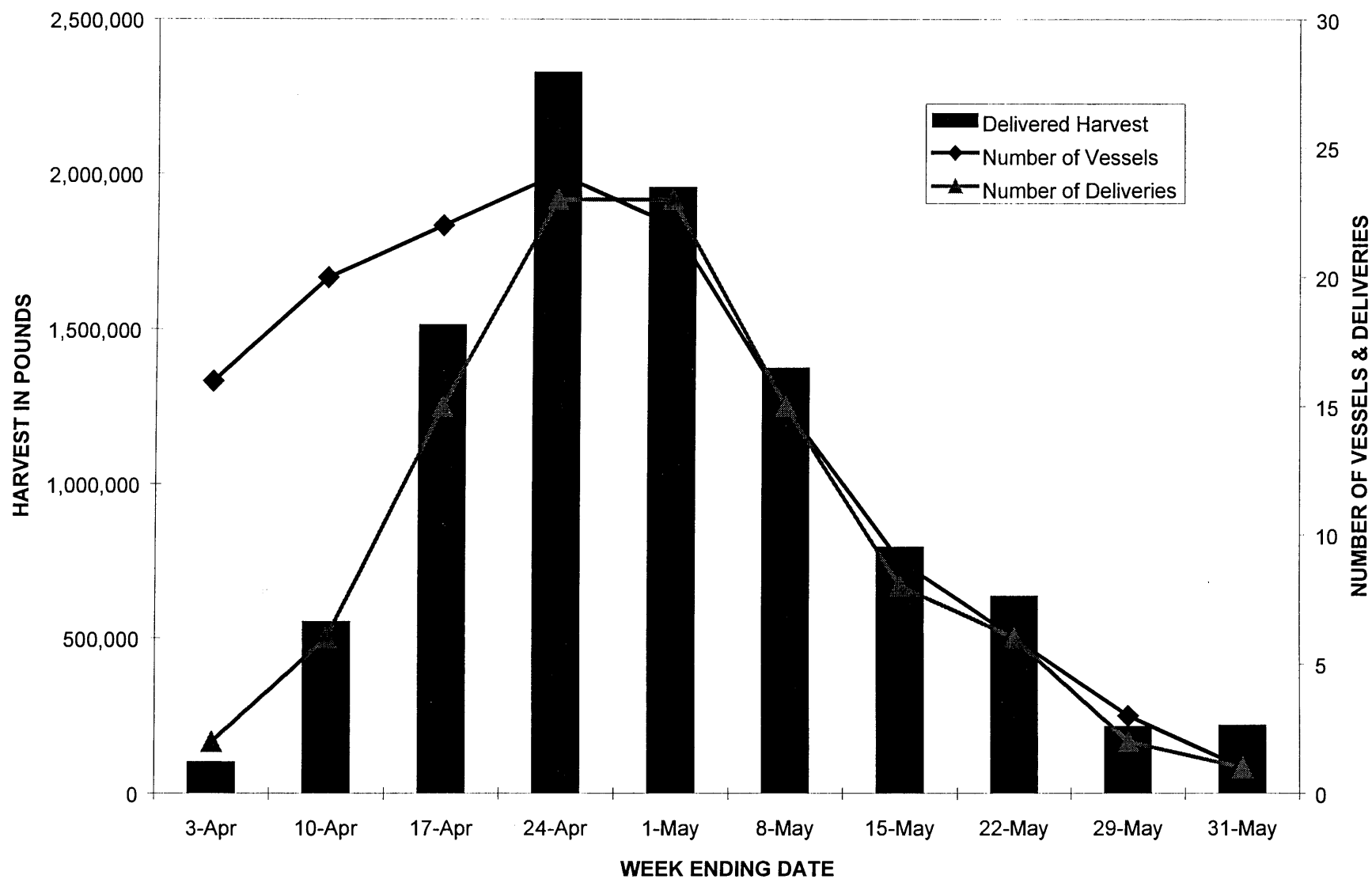


Figure 5-20. Harvest, number of vessels and deliveries by week in the 1999 Bering Sea CDQ snow crab fishery.

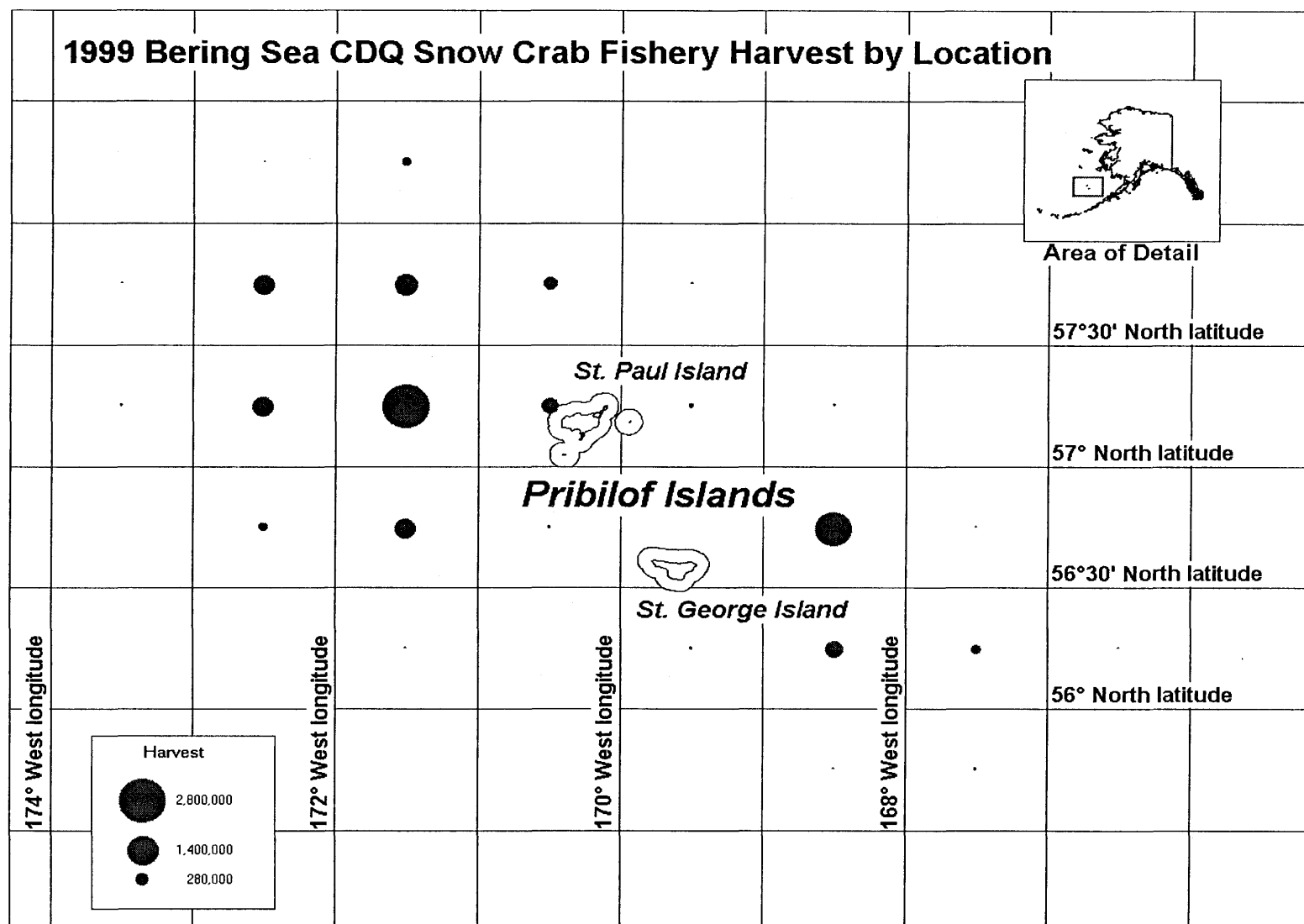


Figure 5-21. Area of harvest in the 1999 Bering Sea CDQ snow crab fishery.

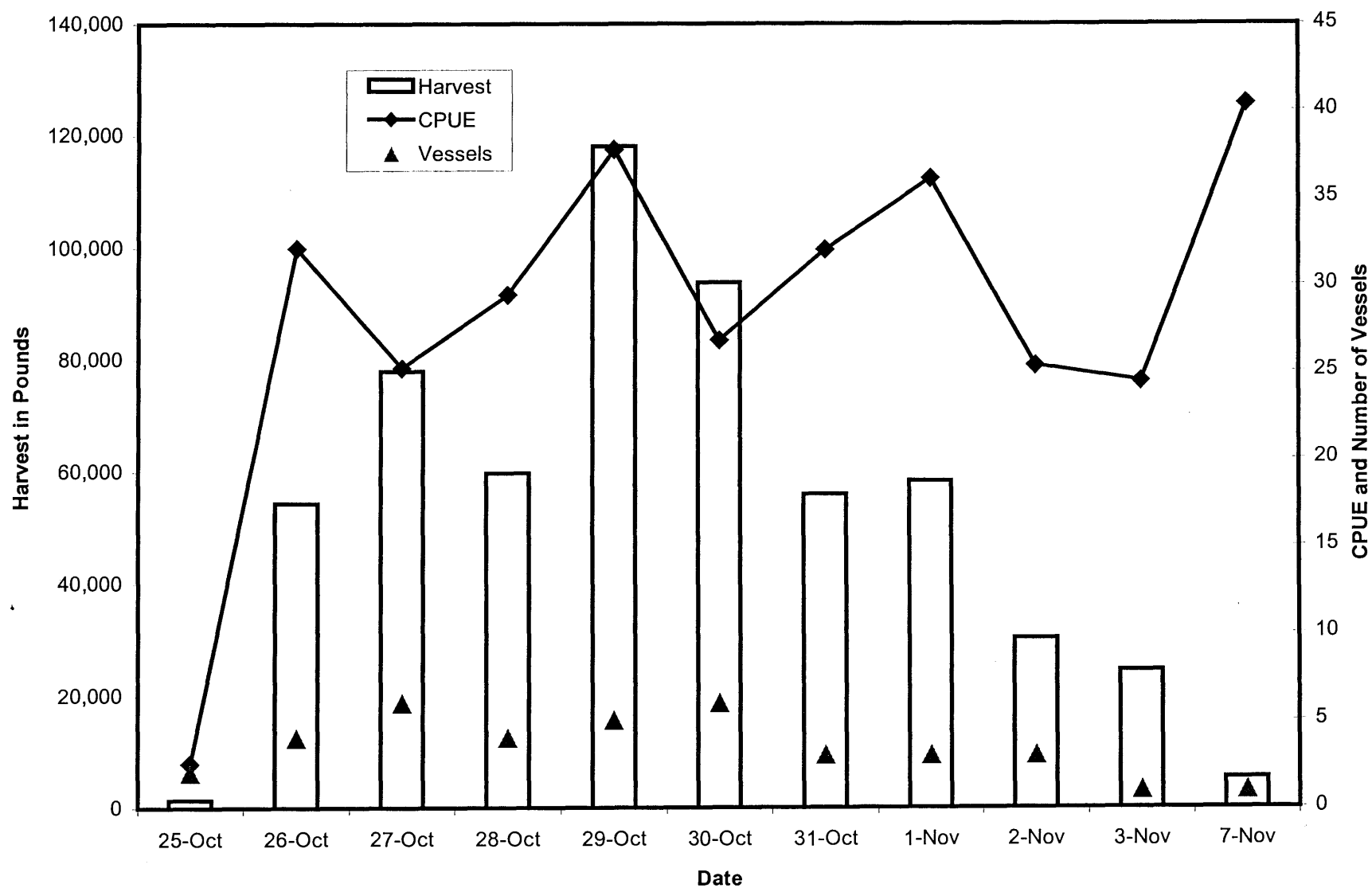


Figure 5-22. Daily harvest, CPUE, and number of vessels in the 1999 Bristol Bay CDQ red king crab fishery.

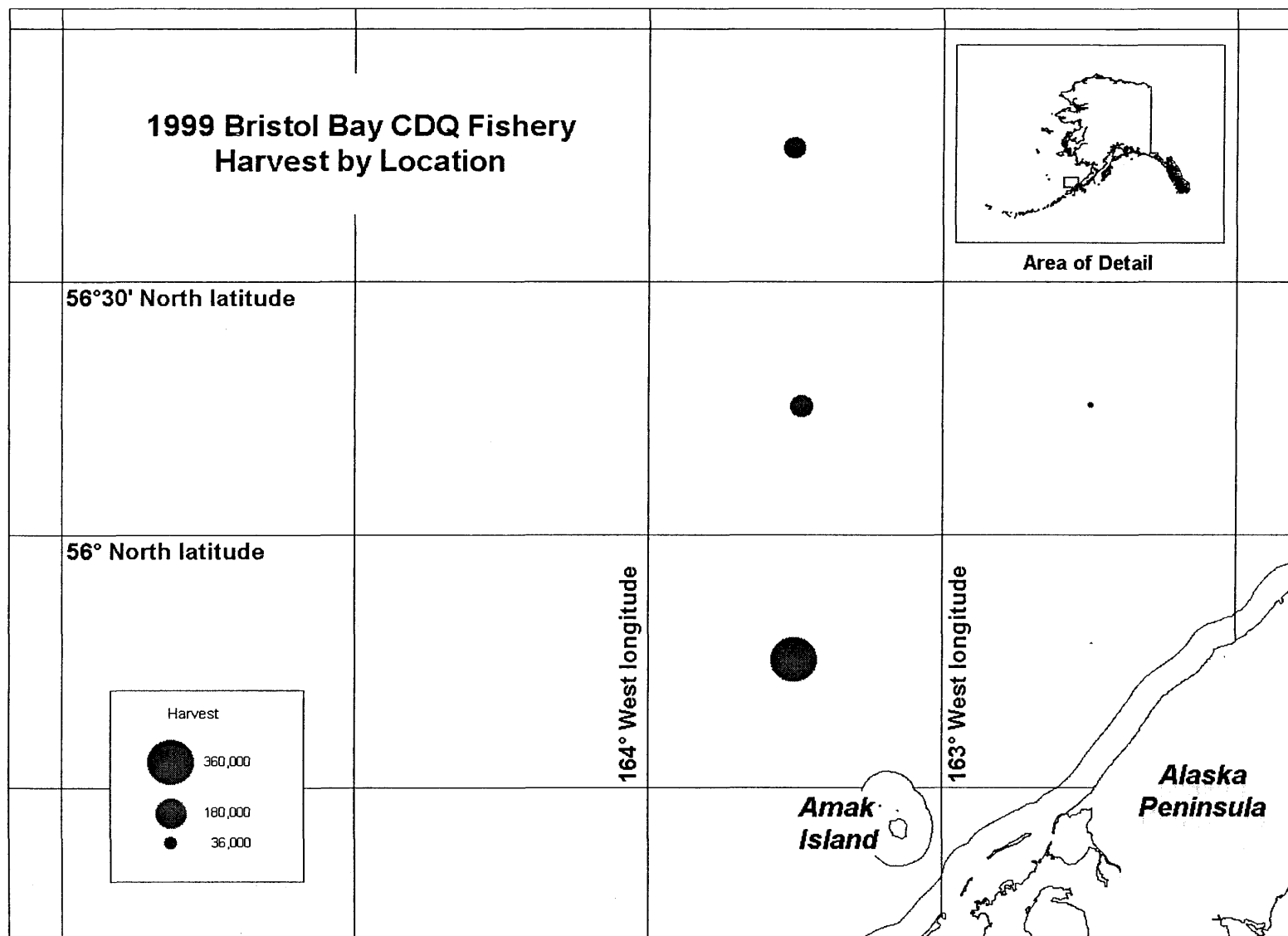


Figure 5-23. Area of harvest in the 1999 Bristol Bay CDQ red king crab fishery.

ANNUAL MANAGEMENT REPORT FOR THE WEATHERVANE SCALLOP FISHERIES
OF THE WESTWARD REGION, 1999/00

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INTRODUCTION

Alaskan weathervane scallop, *Patinopecten caurinus*, populations were first evaluated for commercial potential by government research and private exploratory cruises beginning in the early 1950s. Interest in an Alaska fishery began in the late 1960s as catches declined in the U.S. and Canadian scallop fisheries on Georges Bank (Orensanz 1986). As a result, Alaska's commercial fishery began in 1967 when two vessels delivered scallops harvested from waters east of Kodiak Island.

The first full year of fishing occurred in 1968 when 19 vessels (New England type scallop vessels, converted Alaskan crab boats, salmon seiners, halibut longliners, and shrimp trawlers) entered the fishery (Kaiser 1986). The commercial fishery progressed through several developmental phases. From 1967 through 1973 virgin scallop beds throughout the state were identified and exploited. This was followed by a period of declining scallop harvests from 1974 to the end of the decade. A smaller, more stable fishery followed through the 1980s. Beginning in 1990, the fishery again expanded with an influx of scallop boats from the east coast of the United States (Table 6-1). The fishery changed in the 1990s from one characterized by short trips with numerous deliveries each season to one of long trips with few deliveries as the fleet converted from icing to freezing of the product. The average number of deliveries per year between 1990 and 1994 was 133. By 1996, all the scallop catcher boats participating in the statewide fishery were converted to catcher-processors which freeze product onboard. Freezing product onboard allowed longer trips without fear of product spoilage. An average of 21 deliveries per year were made between 1996 and 1999.

Weathervane scallops aggregate in elongated shaped beds that lie parallel to Alaska's coastline from Southeast Alaska to the Aleutian Islands. Major scallop fishing locations in Alaska coastal waters are shown in Figure 6-1. Scallops are typically found at depths of 20–110 fathoms (120–660 feet), with the majority of the fishing effort occurring between 40 and 60 fathoms (Barnhart and Rosenkranz 2000).

There are nine scallop fishing registration areas in Alaska (Figure 6-2). Unless otherwise indicated, this report describes Westward Region fisheries within Registration Area J, including scallop registration areas K, M, O, Q, and R.

MANAGEMENT HISTORY

Historic Management Measures

From the inception of the fishery in 1967 through mid-May 1993, the Westward Region scallop fishery was passively managed employing minimal management measures. Scallop dredges with rings 4 inches or greater inside diameter were the established gear type. With a permit issued by the Alaska Department of Fish and Game (ADF&G), 3-inch rings could be fished west of the longitude of the westernmost point on Sanak Island (162° 49' W long.). Closed waters and seasons were established to protect crabs and crab habitat. Scallop management was not based on

scallop stock abundance or biology. As catches declined in one bed vessels moved to better grounds. This may have been generally acceptable for a sporadic, low intensity fishery; however, increased participation led to 'boom and bust' cycles experienced from 1967 to 1992.

Season Dates

From 1967 when the Alaska scallop fishery began, through 1970 there were no closed seasons. In 1971, a scallop season was established to protect spawning king crabs, *Paralithodes camtschaticus*, in the Kodiak Management Area (Figure 6-3). Under 5AAC 18.710 (g), scallops could be taken from June 1 through March 31 in Pacific Ocean waters north of 57° 37' 07" N lat., and east of 152° 09' 01" W long (Cape Chiniak Light) and the waters of Shelikof Strait north of 57° 17' 20" N lat. (the latitude of Cape Ikolik) (ADF&G 1971).

In 1973, season dates were established on the east side of Kodiak Island to protect molting king crabs. The opening date was set at July 15 because king crabs molt later in this area than in other areas with an opening date of June 1. Under 5AAC 18.710 (g) (2) scallops could be taken from July 15 through March 31 in Pacific Ocean waters south of the latitude of Cape Chiniak Light and north and east of Black Point, excluding those waters northwest of a line from Cape Barnabas to Narrow Cape (ADF&G 1973).

In 1975, the line describing the southern boundary of the Kodiak Management Area open July 15 through March 31 was changed (Figure 6-4). Under 5 AAC 38.420 (2), scallops could be taken from July 15 through March 31 in Pacific Ocean waters south of the latitude of Cape Chiniak Light and east of the longitude of Cape Barnabas to Narrow Cape (ADF&G 1975). However, the scallop season in the remainder of Statistical Area J, including the Semidi District of the Kodiak Management Area, Alaska Peninsula, Dutch Harbor, Bering Sea, and Adak Management Areas remained open year-round. At the Alaska Board of Fisheries (BOF) meeting in March 1994 the weathervane scallop season in the Westward Region (entire Registration Area J) was changed to July 1 through February 15. The regulations became effective July 1, 1994 (ADF&G 1994).

High Impact Emerging Fishery

During the early 1990s, an influx of vessels from the east coast of the U.S. into the Alaska weathervane scallop fishery prompted concerns from both the scallop industry and the ADF&G over scallop resource conservation as well as crab bycatch and impacts on depressed stocks of king and Tanner, *Chionoecetes bairdi*, crabs. Between 1990 and 1993 statewide scallop harvests were at levels comparable to those between 1968 and 1973, which proved to be unsustainable (Table 6-1). Reduced scallop abundance was at least partly responsible for the fishery collapse in the 1970s (Kruse 1994). As a result, the weathervane scallop fishery was designated as a high impact emerging fishery on May 21, 1993 and was closed until an interim management plan was completed (Barnhart and Sagalkin 1998). The resulting interim management plan, with an effective date of July 1, 1993, included mandatory 100% onboard observer coverage, a ban on automatic shucking machines aboard scallop vessels, a maximum crew size of 12, crab bycatch caps, and establishment of scallop guideline harvest ranges (GHRs). In addition, minimum

dredge ring size was established at four inches inside diameter, chafing gear or other devices that decreased the legal inside ring diameter were prohibited, no more than two dredges were permitted to be operated at one time from a vessel, and the opening of a scallop dredge was restricted to a maximum width of 15 feet. Four scallop registration areas were initially established in the Westward Region, including Kodiak (K), Alaska Peninsula (M), Dutch Harbor (O), and Adak-Bristol Bay-Bering Sea (Q). In March 1994, the Adak portion of Area Q was designated a separate area and established as scallop registration area R.

The interim management plan contained provisions for king and Tanner crab bycatch limits for most areas within the Westward Region. Methods used to determine bycatch caps in the groundfish fisheries around Kodiak were applied to the scallop fishery. A bycatch cap of one percent of the surveyed crab population was used in areas where a directed commercial crab fishery occurred in the same year. If an area did not open to commercial crab fishing during the most recent season, a cap of one-half of one percent was applied. Bycatch caps were based on crab population estimates derived from trawl surveys with the exception of the Bering Sea. Bering Sea crab bycatch caps were established based on historic bycatch rates in the fishery.

Unregulated Scallop Fishing in the EEZ

From inception of the fishery in 1967 through 1995, all vessels participating in the Alaska scallop fishery were registered under the laws of the State of Alaska. Scallop fishing in both state waters (0 to 3 nautical miles) and the federal exclusive economic zone (EEZ; 3 to 200 nautical miles offshore) was managed under state jurisdiction.

In January 1995, the captain of a scallop fishing vessel home-ported in Norfolk, Virginia returned his 1995 scallop interim use permit card to the Commercial Fisheries Entry Commission in Juneau and proceeded to fish scallops in the EEZ disregarding harvest limits, onboard-observer requirements, and other management measures. In response to unanticipated, uncontrolled fishing for scallops in the EEZ outside the jurisdiction of the State of Alaska by this vessel, federal waters in the EEZ were closed to scallop fishing by emergency rule on February 23, 1995. The initial emergency rule was in effect through May 30, 1995, and was extended for an additional 90 days through August 28, 1995. The intent of the emergency rule was to control the unregulated scallop fishery in federal waters until a federal fishery management plan (FMP) could be implemented closing the fishery. Prior to August 28, the North Pacific Fishery Management Council (NPFMC) submitted a proposed FMP which closed scallop fishing in the EEZ for a maximum of one year, with an expiration date of August 28, 1996.

The final rule implementing Amendment 1 to the FMP was filed July 18, 1996 and published in the Federal Register on July 23, 1996. It became effective August 1, 1996 allowing the weathervane scallop fishery to open in the EEZ. Scallop fishing in state waters of the Westward Region was delayed until August 1, 1996 to coincide with the opening of the EEZ. The state continued as the active manager of the fishery with inseason actions duplicated by the National Marine Fisheries Service (NMFS).

Establishment of Guideline Harvest Ranges

The state Fishery Management Plan for Commercial Scallop Fisheries in Alaska adopted by the BOF in 1994 established GHRs for management areas where scallop fishing traditionally occurred. Traditional areas included Yakutat, Prince William Sound, Cook Inlet, Kodiak, and Dutch Harbor. The combined upper limits of the GHRs totaled 890,000 pounds of shucked adductor muscles (meats). The GHR for each area was determined by averaging historic catches from 1969 to 1992 excluding years when there was no fishing or “fishing-up effect” (considered to over-estimate production) occurred.

The department established GHRs for non-traditional areas including the Alaska Peninsula, Bering Sea, and Adak Management Areas prior to the August 1, 1996 opening of the weathervane scallop fishery. The historic high catches for each management area were established as the upper end of the GHRs. The combination of GHRs from traditional and non-traditional areas totaled 1.8 million pounds of shucked meats which was defined as maximum sustainable yield (MSY) in Amendment 1 to the federal FMP.

In 1998, the scallop plan team recommended defining MSY as 1.24 million pounds of shucked meats based on the average landings from 1990-1997, excluding 1995 when the fishery was closed most of the year. Subsequently, MSY was established in Amendment 6 of the FMP at 1.24 million pounds and optimum yield (OY) as a range from 0 to 1.24 million pounds. To accommodate the lower limits the department reduced the upper end of the GHR in Kodiak from 400,000 to 300,000 pounds, in Dutch Harbor from 170,000 to 110,000 pounds, and in the Bering Sea from 600,000 to 400,000 pounds.

Chronology of State and Federal Management Measures

- 1967 through early 1995. Management of scallops (in both state and EEZ waters) under jurisdiction of the State of Alaska. No federal fishery management plan for scallops.
- 1992. ADF&G initiated development of a fishery management plan for scallops.
- 1993. ADF&G Commissioner declared the scallop fishery a high impact emerging fishery. State interim fishery management plan for scallops became effective July 1.
- 1993. NPFMC set control date of January 20, 1993 to provide notice to industry that a moratorium for the scallop fishery might be implemented. Draft federal FMP released for public review in November.
- 1994. State of Alaska, Fishery Management Plan for Commercial Scallop Fisheries in Alaska, adopted by the BOF in March. GHRs established for scallops in Registration Areas D, E, H, K, and O. Scallop season dates set as July 1-February 15 in the Westward Region.
- 1994. The NPFMC voted to adopt a separate FMP for the scallop fishery and institute a moratorium on entry of new vessels. FMP based on premise that all vessels fishing for

scallops in federal waters would register under state laws. Moratorium control date set as April 24.

- February 23, 1995. NMFS implemented a 90-day emergency interim rule (effective through May 30, 1995) to close federal waters off Alaska to scallop fishing in response to unanticipated, uncontrolled fishing in the EEZ. Subsequent extension closed fishery for an additional 90 days through August 28, 1995.
- May 10, 1995. ADF&G issued notice that all state waters in the Westward Region except Dutch Harbor and Adak Management Areas, would not open to scallop fishing.
- July 26, 1995. NMFS approved FMP prepared by NPFMC. FMP closed federal waters off Alaska to scallop fishing for up to one year (until August 28, 1996) or until an amendment provided for management in federal water. During closure period, NPFMC developed Amendment 1 to the federal FMP. Federal management measures parallel state management measures. Regulations allowing scallop season to open in EEZ published in the federal register on July 23, 1996 with effective date August 1, 1996. Scallop fishing in Westward Region state waters delayed until August 1, 1996 to coincide with opening of the EEZ. MSY for weathervane scallops set at 1.8 million pounds of shucked meats.
- 1997. NMFS approved FMP Amendment 2 (vessel moratorium) on March 5. Eighteen vessels qualified for federal moratorium permits.
- 1997. Alaska legislature approved legislation establishing scallop vessel moratorium for state waters. Moratorium expires June 30, 2001. Ten vessels qualify to fish scallops under state moratorium.
- 1998. NMFS approved Amendment 3 to the FMP which delegated authority to the state to manage all aspects of the scallop fishery in federal waters except limited access.
- April 1998. Amendment 5 to the FMP defined and described essential fish habitat for scallops.
- April 1998. Draft Amendment 6 to the FMP revised definition of overfishing and OY, described new definitions for MSY and minimum stock size threshold (MSST). MSY set at 1.24 million pounds.
- May 1998. Final rule. Magnuson-Stevens Act provisions; National Standard Guidelines. NMFS revises guidelines for National Standards 1, 2, 4, 5, 7, 8, 9, and 10.
- February 1999. NPFMC final action, Amendment 4, license limitation program (LLP). No area endorsements (all boats permitted to fish statewide). Seven boats permitted to fish statewide (outside Cook Inlet Registration Area) utilizing two 15-foot dredges. Two other vessels permitted to fish outside Cook Inlet with a single 6-foot dredge. All vessels permitted to fish Cook Inlet with a single 6-foot dredge.

OBSERVER PROGRAM

The 1993 ADF&G interim scallop management plan and all subsequent management plans include mandatory 100% onboard observer coverage. Data collection efforts in the early years of the observer program focused on detailed examination of crab bycatch and collection of baseline data relative to scallop biology. Data collection has evolved and expanded to focus more on scallop biology and stock assessment. Data are collected on crab and halibut bycatch, discarded scallop catch, retained scallop catch, catch composition, scallop meat weight recovery, location, area and depth fished, and catch per unit effort (CPUE) (Barnhart 1998). Annual scallop reports are produced from the observer-collected data (Urban et al. 1994; Barnhart et al. 1996; Barnhart and Sagalkin 1998; and Barnhart and Rosenkranz 1999), with the most recent report summarizing observer data from the 1998/99 season (Barnhart and Rosenkranz 2000).

Observers report scallop harvest, number of tows, area fished, and crab bycatch to the ADF&G at least three times each week during the season. These data are incorporated into inseason management decisions.

The scallop industry has been cooperative with voluntary efforts to reduce crab bycatch and release confidential fishing data for management purposes. Vessel owners have taken the initiative to work among themselves, the ADF&G and an independent third party, to reduce crab bycatch. Vessel operators agree to provide vessel owners and an independent third party with confidential inseason fishing information, including scallop harvest and crab bycatch. ADF&G provides each vessel owner with his vessel-specific fishing information. Combined data for all vessels fishing in a given management area are provided to a third party for dissemination to vessel owners. In recent years every vessel operator has voluntarily released their confidential fishing information so it could be used in this and other reports to help the BOF make informed decisions on management issues in areas where few fishermen participate.

CURRENT MANAGEMENT

Overfishing Definition

Sustainable fisheries is a key theme within the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The idea of sustainability is inherent in MSY, a quantity that is central to the MSFCMA's definition of both overfishing and OY (MSFCMA 1996).

Instantaneous natural mortality (M), growth, and common biological reference points (BRPs) were estimated for weathervane scallops in Alaska (Kruse and Funk 1995). Estimates of M ranged from 0.04 to 0.21 with a median of 0.13. A target instantaneous fishing mortality rate (F) of 0.12-0.15 was recommended based on the BRPs.

The overfishing definition for scallops was revised in Amendment 6 to the Fishery Management Plan for the Scallop Fishery off Alaska. Overfishing is a level of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis. Overfishing is defined as a fishing rate in excess of the natural mortality rate ($F_{\text{overfishing}}$).

$\geq M=0.13$). MSY is defined as the largest long-term average catch that can be taken from a stock under prevailing ecological and environmental conditions. The MSY for weathervane scallops is 1.24 million pounds of shucked meats based on the average catch from 1990-1997 (excluding 1995). The MSY control rule is a harvest strategy expected to result in a long-term average catch approximating MSY. The MSY control rule is based on the natural mortality of scallops ($M=0.13$) and is defined as $F_{msy}=M$. Minimum stock size threshold (MSST) equals one-half MSY stock size or 4.76 million pounds.

Annual Exploitation Rates

The NMFS guidelines for National Standard 1 (optimum yield) were revised in 1998 so that the annual harvest level obtained under an OY control rule must always be less than or equal to the harvest level under an MSY control rule (NMFS 1998a). The NMFS report on technical guidance on the use of precautionary approaches to implementing National Standard 1 states: "Target reference points, such as OY, should be set safely below limit reference points, such as the catch level associated with the fishing mortality" (NMFS 1998b). The precautionary approach implements conservation measures even in the absence of scientific certainty that fish stocks are being over-exploited.

Amendment 6 to the scallop FMP established the overfishing control rule as $F=0.13$. This is an instantaneous rate which corresponds to an annual rate of 0.12, therefore the annual exploitation rate must be <0.12 . Harvesting at 75% of 0.12 would appear to satisfy the precautionary approach.

Stock Assessment

During late 1997 and in 1998, ADF&G began exploring Leslie depletion and area-swept methods to estimate scallop abundance from observer-collected data. The Leslie depletion estimator for a closed population models catch per unit effort (CPUE) as a decreasing linear function of cumulative catch taken by the fishery. A simple linear regression is fit and under the assumption that CPUE would continue a linear decline to zero if fishing continued, the intercept of the regression line with the x -axis provides an estimate of abundance at the start of fishing. The assumption of constant catchability implicit in the model is often violated in practice and tends to create negative bias in abundance estimates (Hilborn and Walters 1992).

The area-swept method utilizes CPUE data from the commercial fishery in the same way that stock assessment survey data are used. The scallop bed is divided into discrete cells, and CPUE from each cell is taken as an index of abundance over the entire area of that cell. To convert the indices to estimates of absolute abundance, some assumption on dredge efficiency is required. Note that dredge efficiency cannot be estimated from CPUE data alone.

Both methods were used to estimate abundance in traditional scallop fishing areas of the state. Although the Leslie method produced fairly consistent estimates, fishery performance during consecutive years for which the procedure was applied suggested that true abundance was underestimated. Two problems were encountered with area-swept estimates. A cursory review

of literature from professional journals indicates that dredge efficiency varies substantially with bottom type, tow speed, and other factors (e.g., Giguere and Brulotte 1994), and can range from 2% to over 50% (percentage of scallops in the dredge path that are captured). Unfortunately, there was no way to estimate this quantity. Second, area-swept estimates were sensitive to cell size and total area defined as a bed. Areas outside main fishing locations are dredged infrequently and may or may not contain significant numbers of scallops. Effort from the commercial fishery is not randomly distributed over the area that scallops occupy, an assumption of the area-swept method. These problems led scallop research staff to conclude that fishery-independent survey data and age-structured modeling will be necessary to obtain accurate estimates of scallop abundance. Westward Region staff are working on a feasibility study designed to assess a video technique for surveying scallop populations.

Bycatch Caps

King and Tanner crab bycatch caps are established for each management area or district (except the Bering Sea), based on the most recent crab trawl survey data, and published in a news release approximately one month prior to the opening of the scallop season. Bering Sea crab bycatch caps are determined by historic bycatch rates in the fishery. Methods used to determine bycatch limits in the groundfish fisheries around Kodiak are applied to all scallop registration areas in the Westward Region except the Bering Sea. A bycatch cap of one percent of the surveyed crab population is used in areas where a directed commercial crab fishery occurs in the same year. If an area did not open to commercial crab fishing during the most recent season, a cap of one-half of one percent is applied.

Onboard observers report crab bycatch to the department three times each week and areas are closed when the bycatch cap is reached.

Other Management Measures

As previously noted, the upper ends of the GHRs are based on historic production. By definition, GHRs are specified as a range from zero to the upper end of the range. The department may decide to close an area at any appropriate level within the range if conditions warrant.

A management area or portion of a management area may also be closed inseason based on concerns including declining CPUE, indications of little or no recruitment of scallops into the fishery, or localized depletion.

Another management measure which may be used by the department to set harvest levels is the application of criteria from Amendment 56 to the Bering Sea Aleutian Island (BSAI) Groundfish FMP (NPFMC 1999). Under Amendment 56, in the absence of better data, the upper end of the GHR is set at 75% of the catch history.

Shell Aging

To determine scallop age from shells, the exterior surface of the left (upper) valve is examined and yearly annuli or 'checks' associated with slow growth periods in the annual growth cycle are counted. Determining yearly annuli locations during the first few years of growth has been problematic. Scallop shell aging techniques have been reviewed in conjunction with three individuals familiar with shell aging of scallops. The technique was reviewed with Dr. Neil Bourne at the Pacific Biological Station in Nanaimo, British Columbia, and samples of shell-aged weathervane scallop were sent to Dr. Alla Silina at the Institute of Marine Biology in Vladivostok, Russia and Mr. Ross Chandler at St. Andrews Biological Station in New Brunswick, Canada for comparative analyses. A range of results were obtained from these three experts.

Due to the subjective nature of the technique and the lack of baseline studies on aging weathervane scallops, other methods of aging were considered. Carbon and oxygen isotope analysis of scallop shell calcite was chosen to determine annuli placement on the shell surface. Isotope analysis conducted on a selection of shells provided by the department is in progress and will provide baseline age data from all regions of the state to serve as a reference data set for traditional surface shell aging (visual examination of the shell surface).

Shell age data will be used to determine the age structure of scallop populations throughout the state. Utilizing geographical information system (GIS) software in conjunction with age data, observer data, and specific haul information, the department will be able to plot distinct beds and overlay scallop age and size composition data. GIS display of these data will provide important information for management of the fishery.

KODIAK REGISTRATION AREA

Historic Background

The Kodiak Registration Area K, encompassing the Northeast, Shelikof, and Semidi Districts, includes the waters of the Pacific Ocean south of the latitude of Cape Douglas and east of the longitude of Cape Kumlik (5AAC 38.076 (b)(5) Figure 6-5).

Commercial fishing for weathervane scallops in Alaska began in 1967, when two vessels delivered 778 pounds of scallop meats harvested from waters east of Kodiak Island (Table 6-2). During 1968, eight vessels harvested 734,084 pounds of scallop meats in the Kodiak Registration Area. The Kodiak scallop fishery peaked in 1970 when seven vessels landed over 1.4 million pounds of scallop meats. Catches declined to zero in 1977 and 1978. Since 1980, landings have fluctuated from a low of 46,971 pounds to a high of 689,497 pounds of scallop meats. There was no harvest in 1995 because the season was closed by federal emergency rule.

Concern about the impact of scallop dredging on crab resources began in 1969 when the ADF&G closed the south end of Kodiak Island and Marmot Bay to scallop fishing by emergency order due to observed high bycatch of king crabs. Subsequently, the BOF adopted the department's recommendation, closing both areas by regulation. During the early 1970s the

regulatory season ending date was changed to March 31 to protect king crabs. In 1990, the BOF closed scallop fishing in Kodiak's west-side bays which had been previously closed to non-pelagic trawls in order to protect depressed king and Tanner crab populations.

1999 Fishery

The 1999/00 scallop fishing season was open July 1, 1999 to February 15, 2000. No effort occurred after September 1999. To facilitate distribution of fishing effort and crab bycatch limits, king crab districts as described in 5AAC 34.405 were utilized (ADFG 1999).

Shelikof District

The Shelikof District of the Kodiak Registration Area includes all waters north of a line from the westernmost tip of Cape Ikolik to the southernmost tip of Cape Kilokak, west of a line from the northernmost tip of Inner Point to the southernmost tip of Afognak Point, west of 152°30' W long. in Shuyak Strait, and west of the longitude of the northernmost tip of Shuyak Island (152° 20' W long.)

The GHR for the Shelikof District, as announced by news release on June 4, 1999, was zero to 180,000 pounds of shucked meats. The bycatch limit was set at 250 king and 42,500 Tanner crabs. An emergency order was issued closing the Shelikof District to scallop fishing on September 6, 1999. Five vessels participated in the Shelikof District fishery. Inseason observer reports showed that approximately 182,000 pounds of shucked meats were harvested through September 5, 1999, reaching the upper end of the GHR. Fish tickets submitted after the fishery closed, totaled 187,963 pounds of shucked meats. Observer reports show approximately 38,000 Tanner crabs were taken from a bycatch cap of 42,500 crabs. Vessels shifted their effort to the Northeast District of the Kodiak Registration Area after the Shelikof District closed.

Northeast District

The Northeast District of the Kodiak Registration Area includes all waters northeast of a line extending 180° from the easternmost tip of Cape Barnabas, east of a line from the northernmost tip of Inner Point to the southernmost tip of Afognak Point, east of 152° 30' in Shuyak Strait, and east of the longitude of the northernmost tip of Shuyak Island (152° 20' W long).

The GHR for the Northeast District, as announced by news release on June 4, 1999, was zero to 75,000 pounds of shucked scallop meats. The bycatch limit was established at 150 king and 66,500 Tanner crabs. The 1999/00 scallop fishing season in the Northeast District was open from July 1, 1999 to September 9, 2000 when it closed by emergency order. Three catcher-processors participated in the Northeast District fishery. End of season fish ticket submissions totaled 77,119 pounds of shucked meats. Observer reports show that approximately 13,000 Tanner crabs were taken from a bycatch limit of 66,500 crabs. No king crabs were caught.

Semidi District

The Semidi District of the Kodiak Registration Area includes all Pacific Ocean waters west of the longitude of Cape Kilokak and east of the longitude of Cape Kumlik.

There are no crab bycatch caps established for the Semidi Islands because the ADF&G does not conduct a complete Tanner crab survey in this area. The department closely monitors inseason scallop harvest and crab bycatch to determine appropriate catch levels. The Semidi District opened July 1, 1999 and remained open until February 15, 2000 when it closed by regulation. No effort occurred after September 1999. Fish tickets submitted after the fishery totaled 930 pounds of scallop meats. Inseason observer reports show that 25 Tanner crabs were taken as incidental bycatch.

ALASKA PENINSULA REGISTRATION AREA

Historic Background

The Alaska Peninsula Registration Area M includes waters of the Pacific Ocean west of the longitude of Cape Kumlik and east of the longitude of Scotch Cap Light (5AAC 38.076 (b)(6) Figure 6-6).

Closed areas include waters within three miles of shore and the offshore waters of Unimak Bight and around Mitrofanina Island. The Unimak closure was adopted in the early 1970s to protect king crab habitat. The Mitrofanina Island closure was adopted in the mid-1980s to protect Tanner crab populations.

Historic fishing effort for scallops in the Alaska Peninsula Registration Area has been sporadic. Most catch and effort information prior to 1993 is confidential because few boats fished in the area. However, the average annual harvest during the nine years of participation prior to 1993 was 41,888 pound of scallop meats. The highest harvest was in 1982 when six vessels landed 205,691 pounds of shucked meats (Table 6-3).

1999 Fishery

The GHR for the Alaska Peninsula Registration Area, as announced by news release on June 4, 1999, was zero to 200,000 pounds of shucked meats. The crab bycatch limit was set at 300 king and 75,500 Tanner crabs. The 1999 fishery opened July 1, however no effort occurred until the third week in August. Waters of the Alaska Peninsula between 160° and 161° W longitude were closed by emergency order on September 29, 1999. Five vessels harvested 75,535 pounds of shucked meats. Observer reports show approximately 27,000 Tanner crabs were taken from a bycatch cap of 75,500 Tanner crabs. One king crab was taken from a bycatch cap of 300 king crabs. The fleet concentrated on scallop grounds in two statistical areas encompassed by the closure. Overall catch rates were lower than in previous years and declined as the season progressed. Significant portions of the scallop resource in these areas have apparently been

removed. The season was closed to avoid localized depletion on the fishing grounds targeted by the fleet. Very little harvest occurred in the remainder of the management area although it remained open until February 15, 2000 when it closed by regulation.

BERING SEA REGISTRATION AREA

Historic Background

The Bering Sea Scallop Registration Area Q has a southern boundary line from the latitude of Cape Sarichef to 171° W long, then north to 55° 30' N lat. and west to the U.S. - Russia Convention Line of 1867 (5AAC 38.076 (b)(8) Figure 6-7). The area encompasses all waters of the Bering Sea north of this line. Area Q was established as the Bering Sea Area by the BOF in 1994. Prior to this change, Area Q included waters of Adak (Area R).

ADF&G records indicate that scallops were first harvested from the Bering Sea in 1987, and again in 1990 and 1991 (Table 6-4). During those years few vessels participated, so catch and effort information is confidential. However, the average annual catch for the three confidential years was 68,189 pounds of shucked meats. No additional landings were made from this area until 1993 when 10 vessels harvested 613,813 pounds of scallop meats. During the 1994/95 fishery, eight vessels harvested 505,439 pounds of shucked meats. Since then, scallop catches have been restrained below those levels by crab bycatch.

1999 Fishery

The GHR for the Bering Sea Registration Area, as announced by news release on June 4, 1999, was zero to 400,000 pounds of shucked meats. Crab bycatch limits were established at 65,000 *Chionoecetes bairdi* Tanner crabs, 300,000 *Chionoecetes opilio* and hybrid Tanner crabs, and 500 king crabs. The 1999/00 fishery opened July 1 and the Bering Sea Management Area was closed by emergency order on August 30, 1999. Two catcher-processors harvested 164,929 pounds of scallop meats. Projections based on observer reports showed that the bycatch limit of 65,000 *C. bairdi* Tanner crabs would be reached by August 30, 1999. In addition, one king crab and approximately 141,000 *C. opilio* and hybrid Tanner crabs were caught incidentally.

DUTCH HARBOR REGISTRATION AREA

Historic Background

The Dutch Harbor Registration Area O includes waters west of the longitude of Scotch Cap Light, east of 171°W long., and south of the latitude of Cape Sarichef. The southern boundary extends 200 miles seaward from the territorial sea baseline (Figure 6-8).

Closed waters were established to protect crab nursery areas. Through the 1993 season, the Dutch Harbor Registration Area was open year-round to scallop dredging. At the BOF meeting in March 1994 the regulatory season dates were changed to July 1 through February 15.

ADF&G records show that the first harvest of weathervane scallops from the Dutch Harbor Registration Area took place in 1982, when five vessels landed 62,105 pounds of scallop meats (Table 6-5). The average annual catch from 1985 through 1992 was 203,695 pounds of scallop meats. In 1993, three vessels landed 39,346 pounds of scallop meats. During the 1994/95 season, 1,931 pounds of scallop meats were landed by three vessels. For the 1995/96 season, scallop fishing was limited to state waters only. Catch and effort information is confidential because only one vessel participated in the fishery. The scallop catch increased to 5,790 pounds in the 1997/98 season and to 46,432 pounds during the 1998/99 season.

1999 Fishery

The GHR for the Dutch Harbor Registration Area, as announced by news release on June 4, 1999, was zero to 110,000 pounds of shucked meats. Bycatch limits were established at 10 king and 10,700 Tanner crabs. The 1999 fishery opened July 1, but no effort occurred until mid-September. The Dutch Harbor Registration Area closed by emergency order on October 1, 1999 to preserve the scallop resource and prevent localized depletion. One catcher-processor harvested 6,465 pounds of shucked meats. Observer reports show approximately 4,400 Tanner crabs were taken from a bycatch cap of 10,700 Tanner crabs. Fishing effort was concentrated on grounds fished heavily in 1998. Catch rates were lower than in previous years and declined as the season progressed.

ADAK REGISTRATION AREA

Historic Background

The Adak Registration Area R includes all Bering Sea waters west of 171° W long. and east of the U.S. - Russia Convention Line of 1867 and south of 55° 30' N lat. (Figure 6-9). At the March 1994 BOF meeting, Area R (Adak) was established as a separate registration area. Prior to that time, it was included in Area Q (Adak-Bristol Bay-Bering Sea).

The Petrel Bank, between 51°30' N lat. and 54° 30' N lat., west of 179° W long. and east of 179° E long. was closed by emergency order on March 21, 1991, due to concerns about king crab bycatch in the *Chlamys* (pink scallop) fishery. On November 1, 1991, before the initial emergency order expired, a second emergency order was issued closing this area until June 1, 1994, providing time for the department to bring the conservation concerns to the attention of the BOF. In 1993, the BOF adopted the department's recommendation closing the area by regulation.

ADF&G records indicate three years of reported harvest: 1979, 1992, and 1995. Catch and effort information remains confidential because few vessels participated in any one year.

Little is known about the scallop population in Registration Area R, but it is believed to be limited. The continental shelf adjacent to the Aleutian Islands is narrow, with little weathervane scallop habitat.

1999 Fishery

The 1999 fishery opened July 1, 1999 and closed by regulation on February 15, 2000. No vessels participated in this fishery.

STOCK STATUS

No fishery-independent surveys or formal stock assessments have been conducted for Alaska's weathervane scallop resource. Information on stock status provided by the observer program since 1993 includes fishery performance measured by CPUE and size composition of the scallop catch. These data must be interpreted with caution due to year-to-year changes in fishing locations within management areas and districts.

Kodiak Registration Area

Northeast District

In the Northeast District average scallop shell height (SH) from the retained catch has declined. During the 1996/97 season average size was 144 mm SH, declining slightly in 1997/98 to 140 mm SH, and in 1998/99 to 127 mm SH (Table 6-6). Scallop CPUE, expressed in round weight of retained scallops per dredge-hour (lbs/drg-hr), increased from 253 lbs/drg-hr to 497 lbs/drg-hr over the same 3 year period. There is some evidence of recruitment into the population (Figure 6-10).

Shelikof District

Consistent fishery performance had been observed in the Shelikof District in recent years. Average SH in the Shelikof District has remained constant at 136-139 mm from 1996/97 to 1998/99. Scallop CPUE was 537 lbs/drg-hr in 1996/97, 565 lbs/drg-hr in 1997/98, and 522 lbs/drg-hr in 1998/99. A wide range of scallop sizes contributed significantly to the 1998/99 season catch (Figure 6-11). Annual height-distribution plots suggest that significant recruitment occurred in 1993 and 1998.

Semidi District

Average SH in the Semidi District has remained relatively uniform between 1996/97 and 1998/99, ranging from 147 to 154 mm. CPUE has declined from 283 lbs/drg-hr in 1996/97 to 149 lbs/drg-hr in 1998/99. Small sample sizes in 1994 and 1998 make interpretation of annual

height-distribution plots difficult to interpret, but there is no indication of significant recruitment into the population in recent years (Figure 6-12).

Alaska Peninsula Registration Area

In the Alaska Peninsula Management Area, average size of scallops in the retained catch since 1993 ranged from 119 to 135 mm SH. A large proportion of the catch in each year consisted of scallops <135 mm SH, making estimation of new recruits into the exploited population difficult to infer from annual plots of size distributions (Figure 6-13). CPUE dropped from 575 lbs/drg-hr during the 1993/94 season to 372 lbs/drg-hr in 1994/95, but it has remained consistent since then with an average of about 380 lbs/drg-hr.

Bering Sea Registration Area

In the Bering Sea Management Area, average scallop SH changed little between 1993/94 and 1998/99 seasons, ranging from 146 to 151 mm. Fishery performance has shown a modest decline since 1993 with an average CPUE of about 580 lbs/drg-hr for the combined 1993/94, 1994/95, and 1996/97 seasons, as compared to an average CPUE of about 500 lbs/drg-hr for the 1997/98 and 1998/99 seasons. Annual shell-height plots suggest recruitment of a small year class into the exploited population in 1998 (Figure 6-14).

Dutch Harbor Registration Area

Average scallop SH from the retained catch was 127 mm for the 1997/98 season and 128 mm in 1998/99 season. Scallop CPUE has been quite variable ranging from 517 lbs/drg-hr for the 1993/94 season to 291 lbs/drg-hr for 1994/95. There was no fishing effort during the 1996/97 season, and CPUE data for 1995/96 remains confidential. Extremely small sample sizes in 1994 and 1997 preclude inference about recruitment from examination of annual shell-height plots (Figure 6-15).

LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game). 1971. Commercial fishing regulations, 1971. Alaska Department of Fish and Game, Commercial Fisheries Division, Juneau.
- ADF&G (Alaska Department of Fish and Game). 1973. Commercial fishing regulations, 1973. Alaska Department of Fish and Game, Commercial Fisheries Division, Juneau.
- ADF&G (Alaska Department of Fish and Game). 1975. Commercial fishing regulations, 1975. Alaska Department of Fish and Game, Commercial Fisheries Division, Juneau.
- ADF&G (Alaska Department of Fish and Game). 1994. Commercial shellfish fishing regulations, 1994-1995. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Juneau.

- ADF&G (Alaska Department of Fish and Game). 1999. Commercial shellfish fishing regulations, 1999-2000. Alaska Department of Fish and Game, Commercial Fisheries Division, Juneau.
- Barnhart, J. P. 1998. Weathervane scallop observer manual. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K98-32, Kodiak.
- Barnhart, J. P., I. Vining and L. Byrne 1996. A summary of data collected by scallop observers from the 1994/1995 commercial scallop fishery in Alaska's Westward Region. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K96-33, Kodiak.
- Barnhart, J. P., and N. Sagalkin. 1998. Summary and analysis of onboard observer collected data from the 1996/1997 statewide commercial weathervane scallop fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K98-38, Kodiak.
- Barnhart, J. P., and G. Rosenkranz. 1999. Summary and analysis of onboard observer collected data from the 1997/1998 statewide commercial weathervane scallop fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K99-63, Kodiak.
- Barnhart, J. P., and G. Rosenkranz. 2000. Summary and analysis of onboard observer collected data from the 1998/1999 statewide commercial weathervane scallop fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K00-8, Kodiak.
- Giguere, M., and S. Brulotte. 1994. Comparison of sampling techniques, video and dredge, in estimating sea scallop (*Placopecten magellanicus*, Gmelin) populations. J. Shell. Res. 13: 25-30.
- Hilborn, R., and C.J. Walters. 1992. Quantitative fisheries stock assessment. Chapman and Hall, New York.
- Kaiser, R. J. 1986. Characteristics of the Pacific weathervane scallop (*Pecten* [*Patinopecten*] *caurinus*, Gould 1850) fishery in Alaska, 1967-1981. Alaska Department of Fish and Game. Kodiak.
- Kruse, G.H. 1994. Fishery Management Plan for Commercial Scallop Fisheries in Alaska. Alaska Department of Fish and Game (ADF&G), Draft Special Publications No. 5.
- Kruse, G.H., and F.C. Funk. 1995. Biological Reference Points for Weathervane Scallops in Alaska. Poster presented to the North Pacific Symposium on Invertebrate Stock Assessment and Management, Nanaimo, British Columbia, Canada, March 6-10, 1995.
- MSFCMA. 1996. Magnuson-Stevens Fishery Conservation and Management Act as amended through October 11, 1996. U. S. Department of Commerce, NOAA Technical Memorandum NMFS-F/SPO-23. December 1996.
- National Marine Fisheries Service (NMFS). 1998a. Magnuson-Stevens Act Provisions; National Standard Guidelines. Final Rule. May 1998.
- National Marine Fisheries Service (NMFS). 1998b. Technical guidance on the use of precautionary approaches to implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Technical Memorandum NMFS-F/SPO-31. August 1998.
- NPFMC (North Pacific Fishery Management Council). 1999. Environmental Assessment for Amendment 56 to the Fishery Management Plan for the groundfish fishery of the Bering Sea and Aleutian Islands area. January 1999.
- Orensanz, J. M. 1986. Size, environment, and density: the regulation of a scallop stock and its management implications. Pages 195-227. In G.S. Jamieson and N. Bourne (eds.). North Pacific Workshop on Stock Assessment and Management of Invertebrates. Can. Spec. Publ. Fish. Aquat. Sci. 92.

Urban, D., D. Pengilly and I. Vining. 1994. The scallop observer program and statewide data analysis, summary to the Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K94-28, Kodiak.

Table 6-1. Historic commercial catch, number of vessels, and number of landings, weathervane scallops, statewide except Cook Inlet, 1967-1999.

Year	Number Vessels	Number Landings ^a	Commercial Catch ^b
1967	2	6	778 ^c
1968	19	125	1,677,268
1969	19	157	1,849,947
1970	7	137	1,440,338
1971	5	60	931,151
1972	5	65	1,167,034
1973	5	45	1,109,405
1974	3	29	504,438
1975	4	56	435,672
1976		Confidential	
1977		Confidential	
1978		No Fishery	
1979	2	5	24,856
1980	8	56	616,717 ^c
1981	18	101	924,441
1982	13	120	913,996
1983	5	30	192,310
1984	6	52	383,512
1985	7	47	615,564
1986	8	74	667,258
1987	4	54	599,947 ^d
1988	4	47	341,070
1989	7	55	534,763
1990	9	144	1,473,535
1991	6	139	1,136,649
1992	7	133	1,741,578
1993	13	144	1,510,563
1994	15	104	1,240,775
1995	10	29	410,743 ^d
1996	4	19	704,196
1997	6	24	783,703
1998	8	23	818,064
1999	8	18	817,559

^aPrior to and including 1995, number of landings=number of fish tickets.

After 1995, number of landings=number of deliveries.

^bPounds of shucked scallop meats.

^cUnshucked deliveries were converted to shucked meats using a 10% conversion factor

^dIncludes illegal harvest.

Table 6-2. Historic commercial catch, effort, and value of weathervane scallops, Kodiak Management Area, 1967 through 1999/00.

Year	Number Vessels	Number Landings ^a	Commercial Catch (pounds) ^b	Average Landings (pounds) ^b	Average Price/Lb.	Est. Value Exvessel (dollars)	Number Tows
1967 ^c	2	6	778	130	0.70	545	-
1968 ^c	8	89	734,084	8,248	0.85	623,971	-
1969	11	86	1,012,860	11,777	0.85	861,000	-
1970	7	102	1,417,612	13,898	1.00	1,500,000	-
1971	5	48	841,211	17,525	1.05	883,000	-
1972	5	68	1,038,793	15,276	1.15	1,200,000	-
1973	4	42	935,705	22,279	1.20	1,123,000	-
1974	3	14	147,945	10,568	1.30	192,000	-
1975	3	29	294,142	10,143	1.40	412,000	-
1976	1	6	75,245	12,541	1.59	119,000	-
1977	0	0	0	0	0	0	-
1978	0	0	0	0	0	0	-
1979	1	4	24,826	6,206	2.78	69,000	-
1980 ^c	7	33	355,200	10,763	3.60	1,278,720	-
1981	15	62	439,804	7,094	4.00	1,759,216	-
1982	8	62	435,645	7,026	3.25	1,416,000	-
1983	4	24	147,747	6,156	5.00	739,000	-
1984	7	37	309,502	8,365	4.00	1,238,000	-
1985	3	10	46,971	4,697	4.00	188,000	-
1986	5	21	180,600	8,600	4.25	767,550	-
1987	3	25	253,451	10,138	3.45	874,406	-
1988	3	21	195,811	9,324	3.68	720,584	-
1989	5	29	242,557	8,364	3.87	938,696	-
1990	7	73	689,497	9,445	3.43	2,364,974	10,950
1991	4	61	514,348	8,432	3.82	1,964,809	12,884
1992	3	44	389,854	8,860	3.96	1,543,822	8,328
1993 ^{d,e}	4	16	88,279	5,517	5.15	454,637	1,708
1993/94	10	48	318,361	6,633	5.15	1,639,559	7,060
1994/95	10	32	355,628	11,113	5.79	2,052,543	6,449
1995/96				Season Closed			
1996/97	4	13	268,545	20,657	6.30	1,691,833	2,760
1997/98	5	14	360,339	25,739	6.50	2,342,203	4,757
1998/99	8	12	301,600	25,133	6.40	1,930,240	3,515
1999/00	6	9	266,012	29,557	6.25	1,662,575	2,673

^aPrior to 1995/96: number of landings = number of fish tickets.

After 1995/96: number of landings = number of deliveries (off-loads containing Kodiak scallops). Fish tickets required weekly.

^bPounds of shucked scallop meats.

^cUnshucked deliveries were converted to shucked meats using a 10% conversion factor.

^dJanuary 1 - June 30 time period.

^eIncludes harvest from exploratory fishery.

Table 6-3. Historic commercial catch, effort and value of weathervane scallops,
Alaska Peninsula Management Area, 1975 through 1999/00.

Year	Number Vessels	Number Landings ^a	Commercial Catch (pounds) ^b	Average Landings (pounds) ^b	Average Price/Lb	Est. Value Exvessel (dollars)	Number Tows
1975				Confidential			
1976				No Fishing			
1977				No Fishing			
1978				No Fishing			
1979				No Fishing			
1980				No Fishing			
1981				Confidential			
1982	6	20	205,691	10,284	3.35	689,064	-
1983				Confidential			
1984				No Fishing			
1985				Confidential			
1986				No Fishing			
1987				Confidential			
1988				Confidential			
1989				No Fishing			
1990				Confidential			
1991				Confidential			
1992				No Fishing			
1993 ^c	1	1	19,020	19,020	5.15	97,953	208
1993/94	6	7	112,087	16,012	5.15	577,248	928
1994/95	7	11	65,282	5,935	5.79	377,983	1,006
1995/96				Closed			
1996/97	2 ^d	2	12,560	6,280	6.30	79,128	185
1997/98	3	6	51,616	8,603	6.50	335,504	1,054
1998/99	4	4	63,290	15,822	6.40	405,056	684
1999/00	5	5	75,535	15,107	6.25	472,094	1,107

^aPrior to 1995/96: number of landings = number of fish tickets.

After 1995/96: number of landings = number of deliveries (off-loads containing Alaska Peninsula scallops). Fish tickets required weekly.

^bPounds of shucked scallop meats.

^cJanuary 1-June 30 time period.

^dVessel operators released confidential data.

Table 6-4. Historic commercial catch, effort and value of weathervane scallops, Bering Sea Management Area, 1987 through 1999/00.

Year	Number Vessels	Number Landings ^a	Commercial Catch (pounds) ^b	Average Landing (pounds) ^b	Average Price/Lb	Est. Value Exvessel (dollars)	Number Tows
1987			Confidential				
1988			No Reported Catch				
1989			No Reported Catch				
1990			Confidential				
1991			Confidential				
1992			No Reported Catch				
1993 ^c	6	23	329,399	14,322	5.22	1,719,463	3,792
1993/94	9	16	284,414	17,776	5.22	1,484,641	3,578
1994/95	8	29	505,439	17,429	6.00	3,032,634	6,619
1995/96			Season Closed				
1996/97	1 ^d	2	150,295	75,147	NA	NA	952
1997/98	2 ^d	5	97,002	19,400	7.05	683,864	1,276
1998/99	4	4	96,795	24,198	6.30	609,808	1,175
1999/00	2	4	164,929	41,232	6.25	1,030,806	1,736

^aPrior to 1995/96: number of landings = number of fish tickets.

After 1995/96: number of landings = number of deliveries (off-loads containing Bering Sea scallops).

Fish tickets required weekly.

^bPounds of shucked scallop meats.

^cJanuary 1- June 30.

^dVessel operators released confidential data.

Table 6-5. Historic commercial catch, effort, and value of weathervane scallops,
Dutch Harbor Management Area, 1982 through 1999/00.

Year	Number Vessels	Number Landings ^a	Commercial Catch (pounds) ^b	Average Landings (pounds) ^b	Average Price/Lb.	Est. Value Exvessel (dollars)	Number Tows
1982	5	8	62,105	7,763	3.11	193,147	NA
1983			No Reported Catch				
1984			No Reported Catch				
1985			Confidential				
1986	5	37	406,642	10,990	3.50	1,423,247	8,752
1987			Confidential				
1988			Confidential				
1989			Confidential				
1990			Confidential				
1991			Confidential				
1992			Confidential				
1993/94	3	6	39,346	6,558	NA		572
1994/95	3	3	1,931	644	NA		52
1995/96			Confidential/State Water Only				
1996/97			No Reported Fishing				
1997/98	1 ^c	1	5,790	5,790	7.05	40,819	105
1998/99	4	5	46,432	9,286	6.30	295,522	479
1999/00	1 ^c	1	6,465	6,465	6.25	40,500	167

^aPrior to 1995/96: number of landings = number of fish tickets.

After 1995/96: number of landings = number of deliveries (off-loads containing Dutch Harbor scallops) Fish tickets required weekly.

^bPounds of shucked scallop meats.

^cVessel operator released confidential data.

Table 6-6. Average weathervane scallop shell heights from retained catch and catch per unit effort, from scallop observer data, Westward Region, 1993-1998.

MANAGEMENT AREA/DISTRICT												
Year	Kodiak Area						Alaska Peninsula		Bering Sea		Dutch Harbor	
	Northeast District		Shelikof District		Semidi District							
	SH ^a	CPUE ^b	SH ^a	CPUE ^b	SH ^a	CPUE ^b	SH ^a	CPUE ^b	SH ^a	CPUE ^b	SH ^a	CPUE ^b
1993/94	144	319	128	467	145	319	119	575	146	598	128	517
1994/95	151	220	131	404	153	^c	127	372	147	535	158	291
1995/96	Closed		Closed		Closed		Closed		Closed		134	Confidential
1996/97	144	253	136	537	154	283	126	398	147	619	No Effort	
1997/98	140	439	139	565	147	176	135	374	151	482	127	326
1998/99	127	497	137	522	151	149	128	383	147	514	128	417

^aScallop shell heights (SH) measured in a straight line perpendicular from the umbo (hinge) to the most distant point on the outer shell margin.

^bCatch per unit effort (CPUE) = pounds (round weight) of retained scallops per dredge-hour.

^cConfidential, combined with Shelikof.

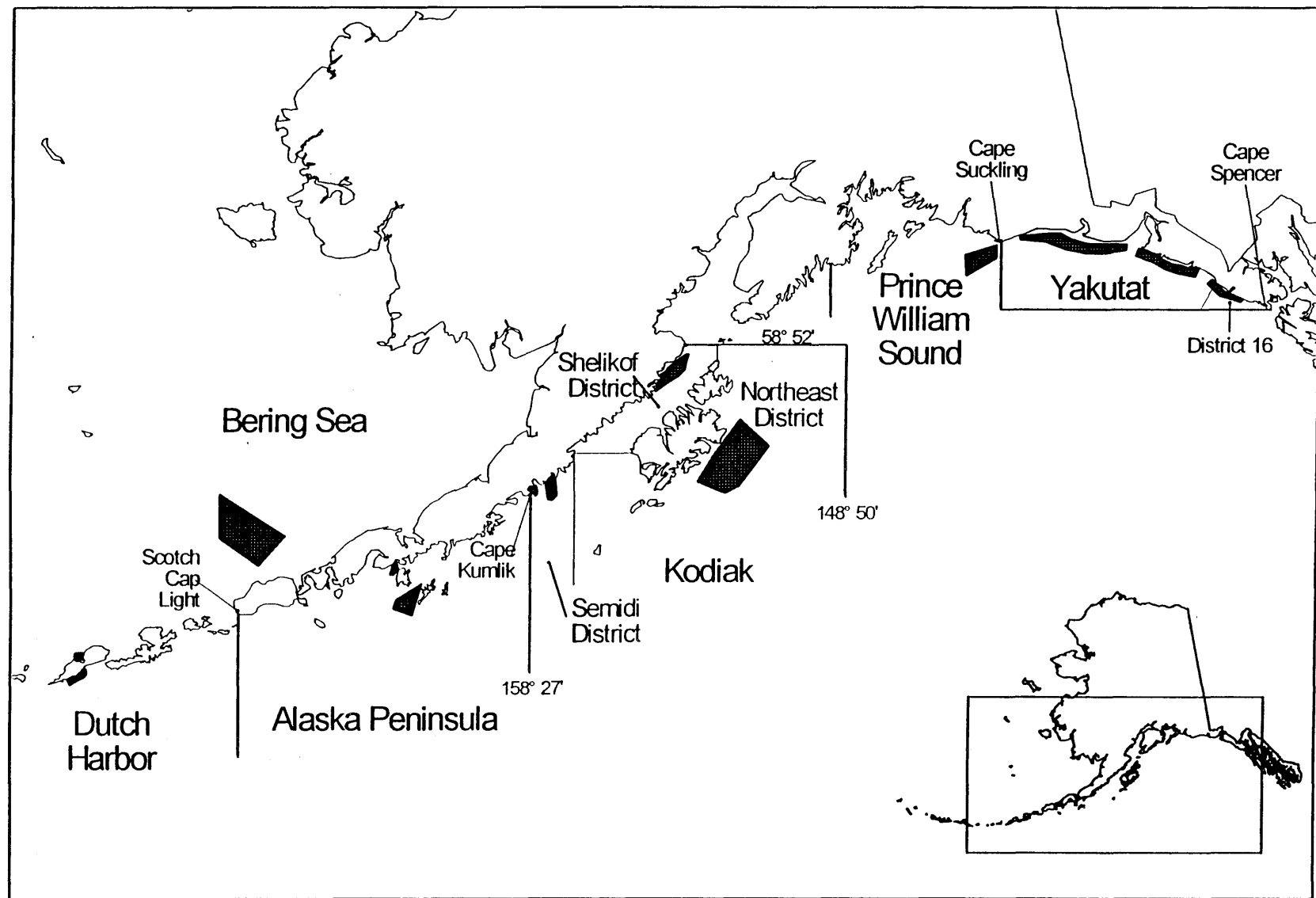


Figure 6-1. Major scallop fishing locations in Alaska coastal waters.

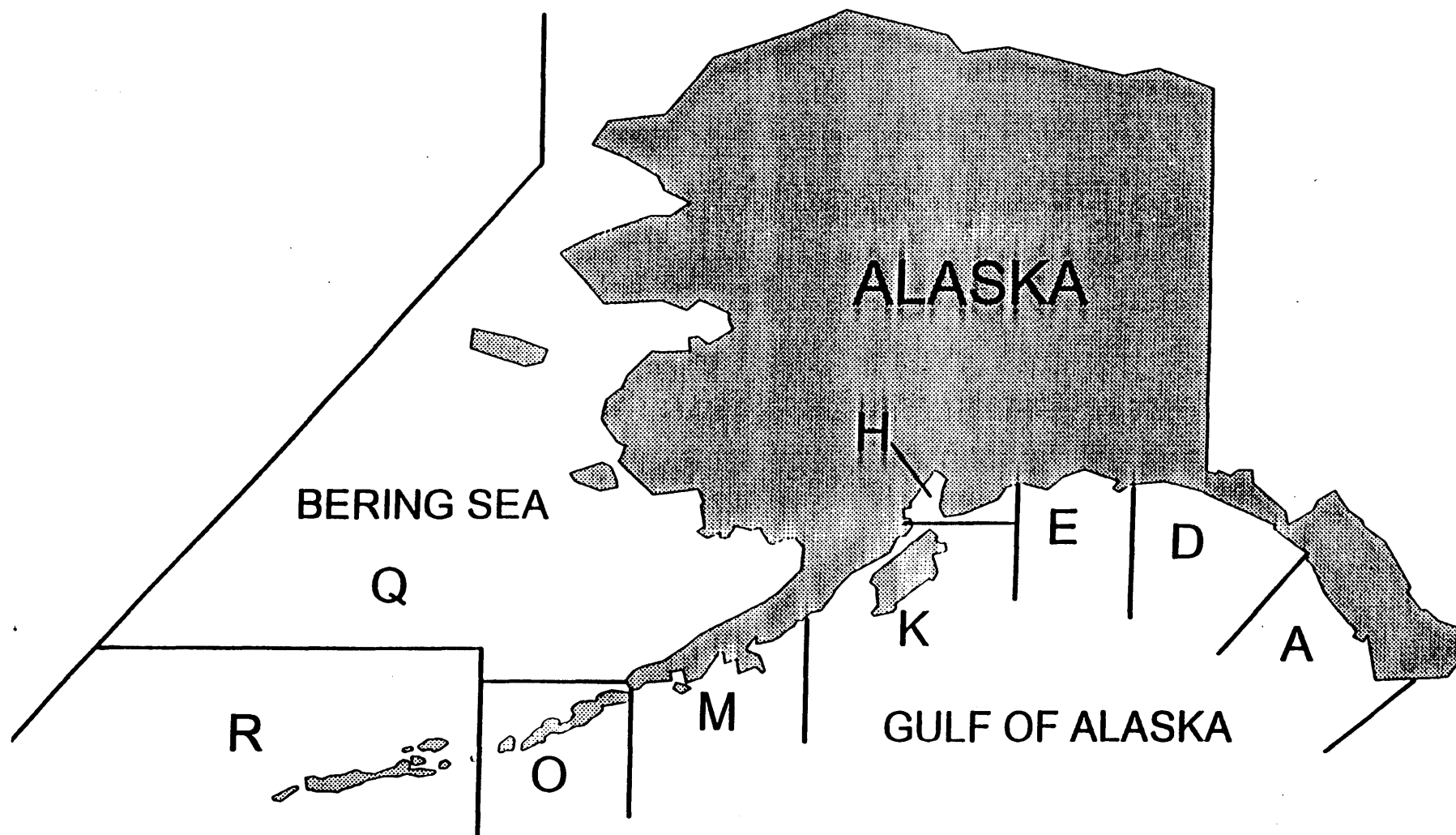


Figure 6-2. State of Alaska scallop fishing registration areas.

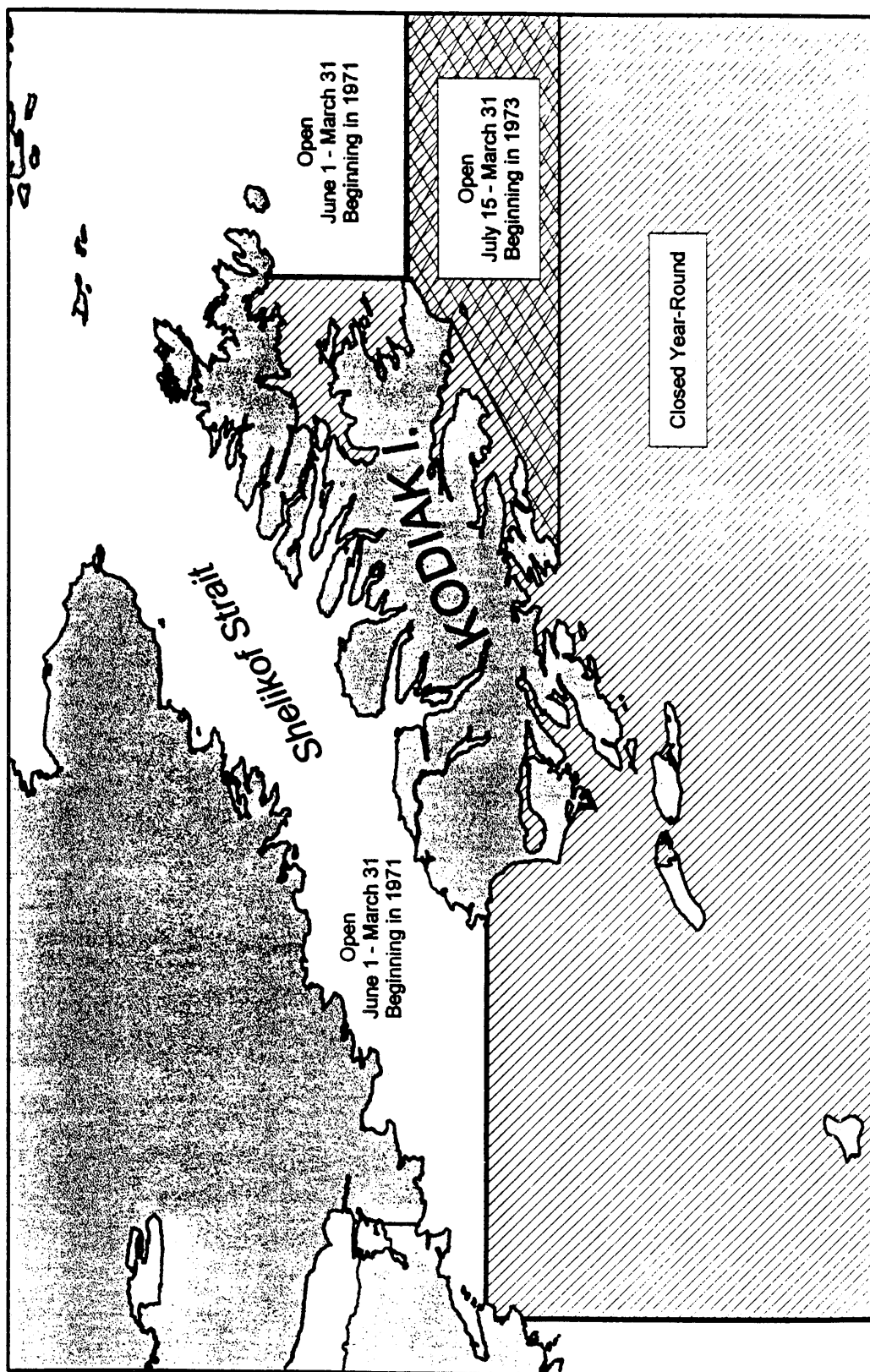


Figure 6-3. Map showing Kodiak Island area waters closed and open to scallop fishing in the early 1970s.

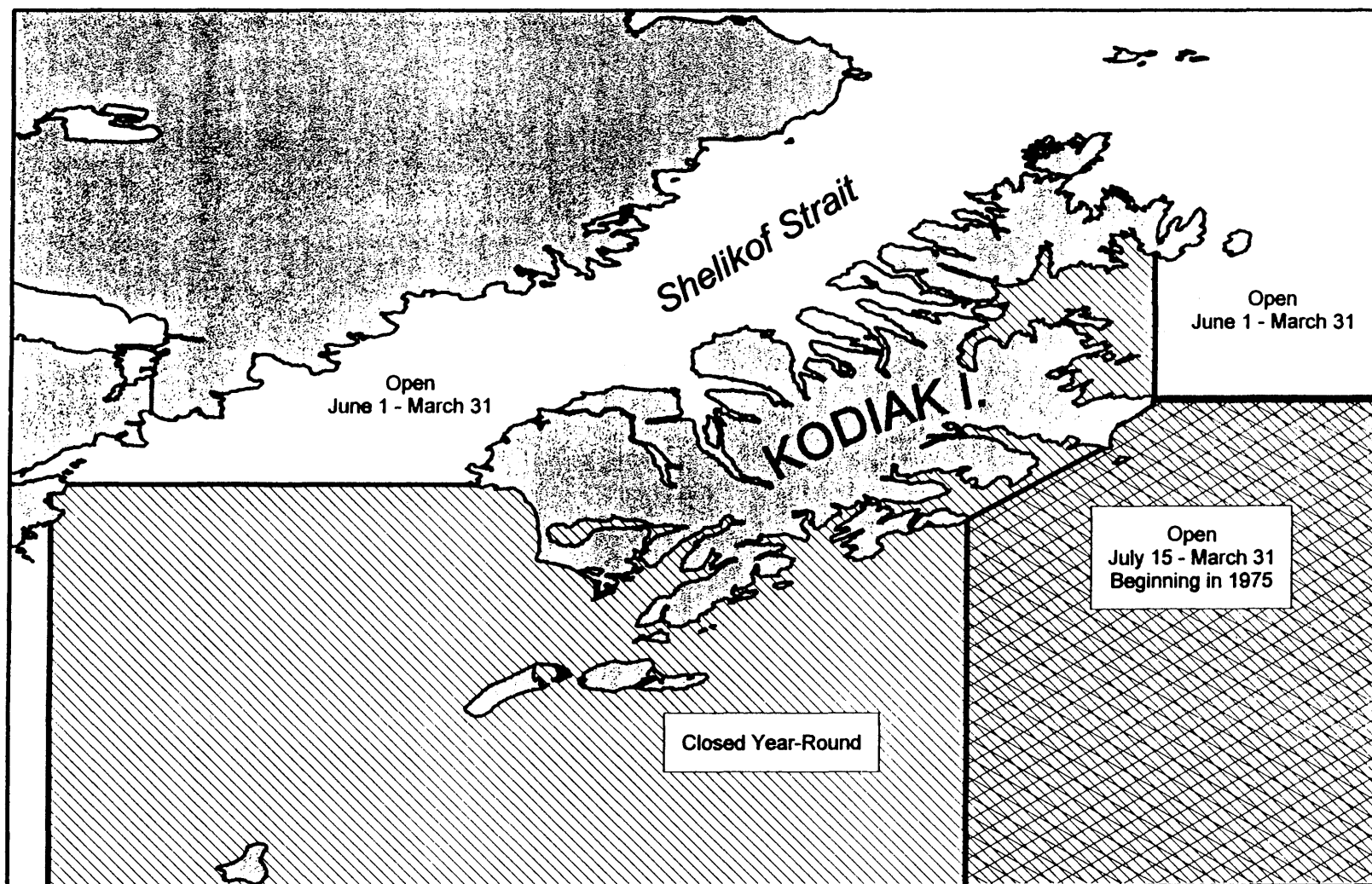


Figure 6-4. Map showing waters closed and open to scallop fishing by 1975 regulations.

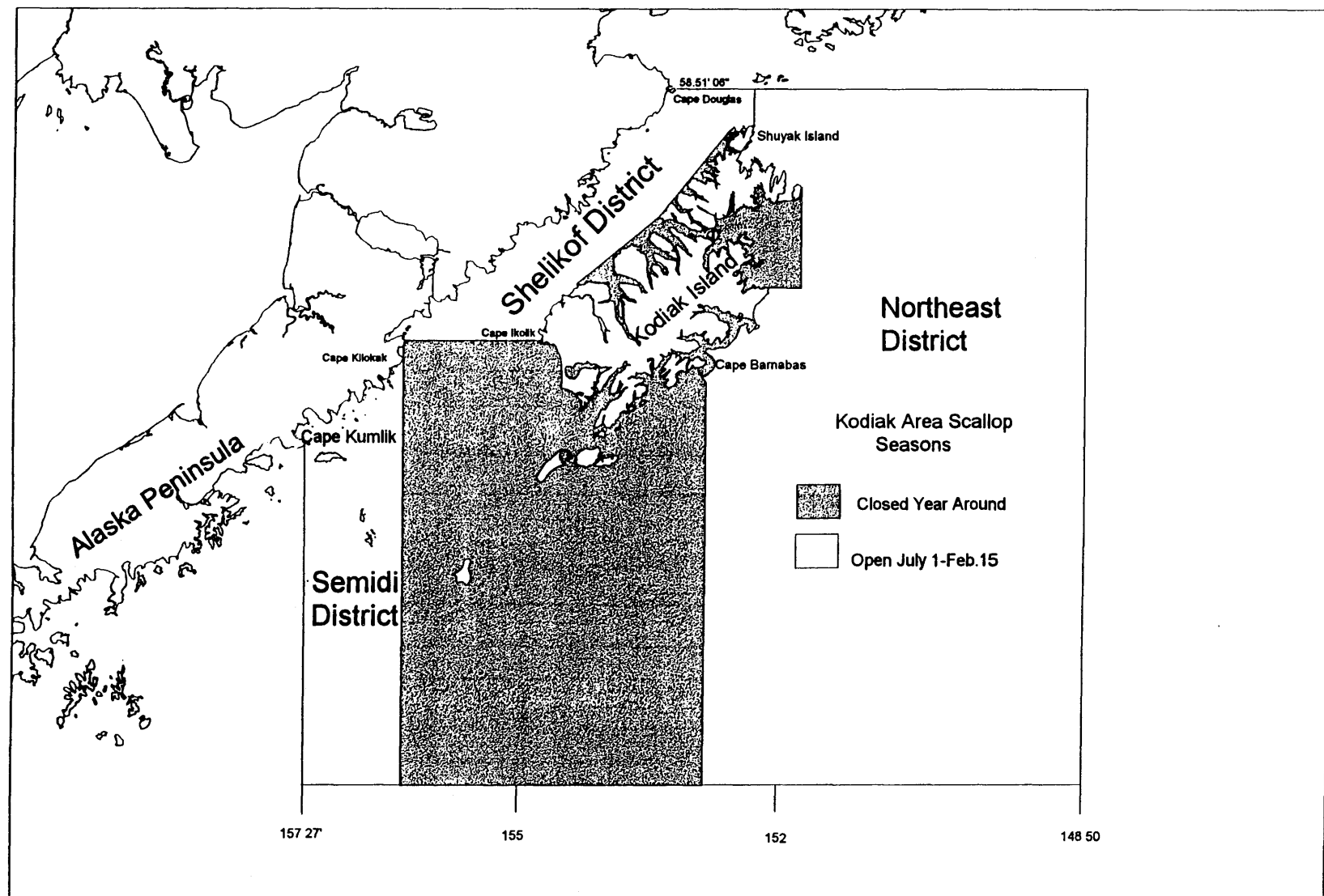


Figure 6-5. Kodiak scallop fishing registration area and closed waters.

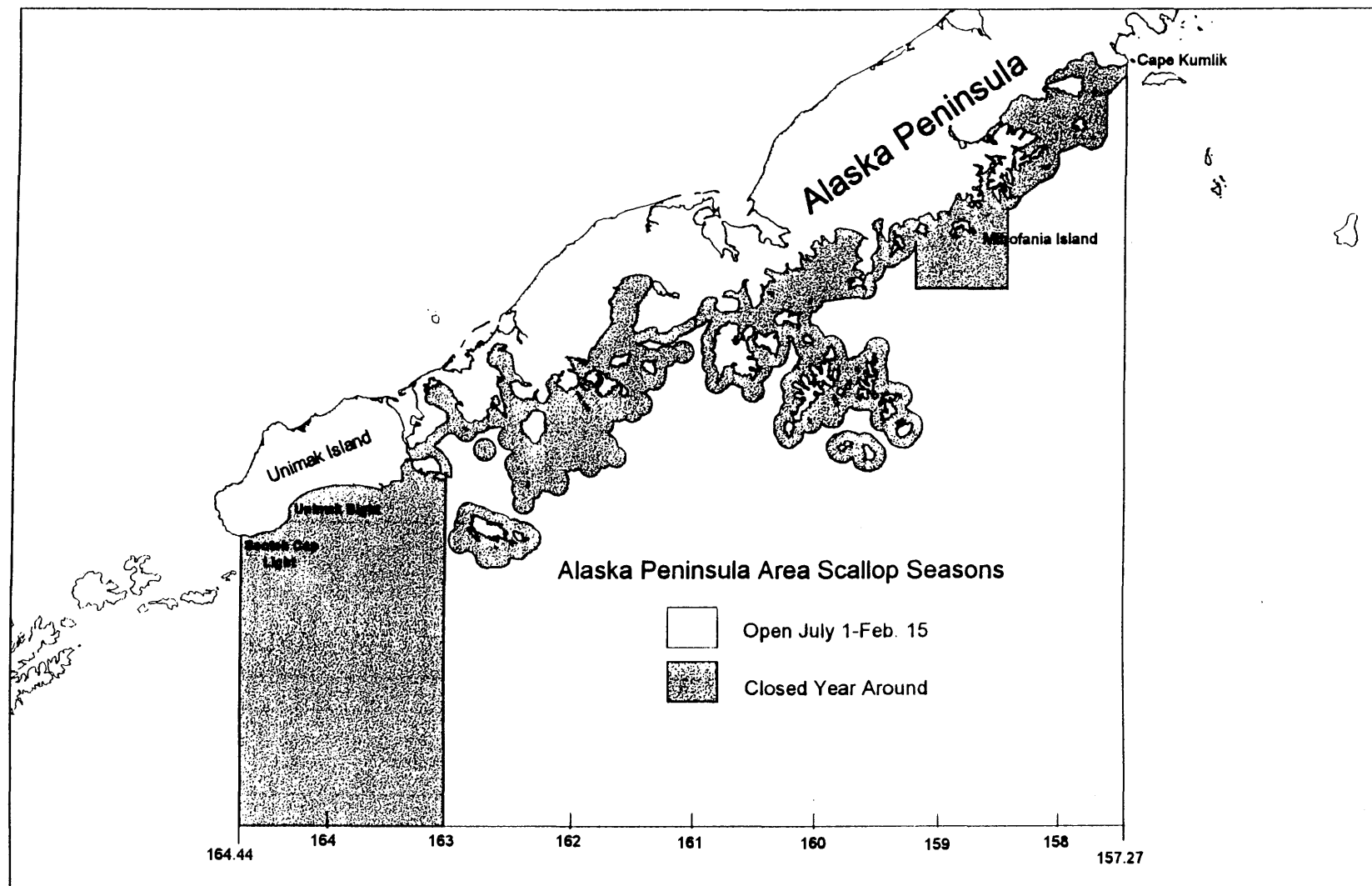


Figure 6-6. Alaska Peninsula scallop fishing registration and closed waters.

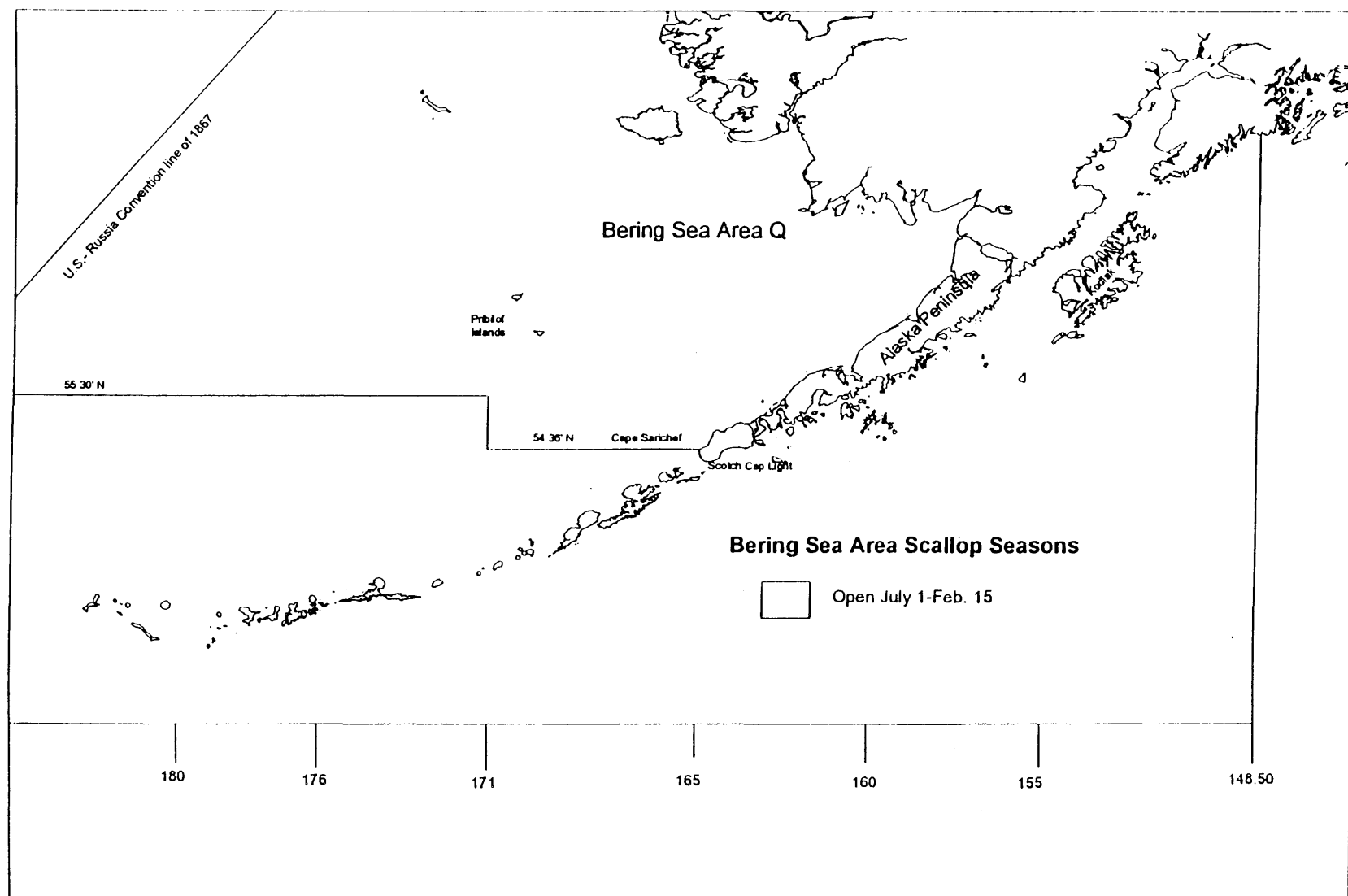


Figure 6-7. Bering Sea scallop fishing registration area.

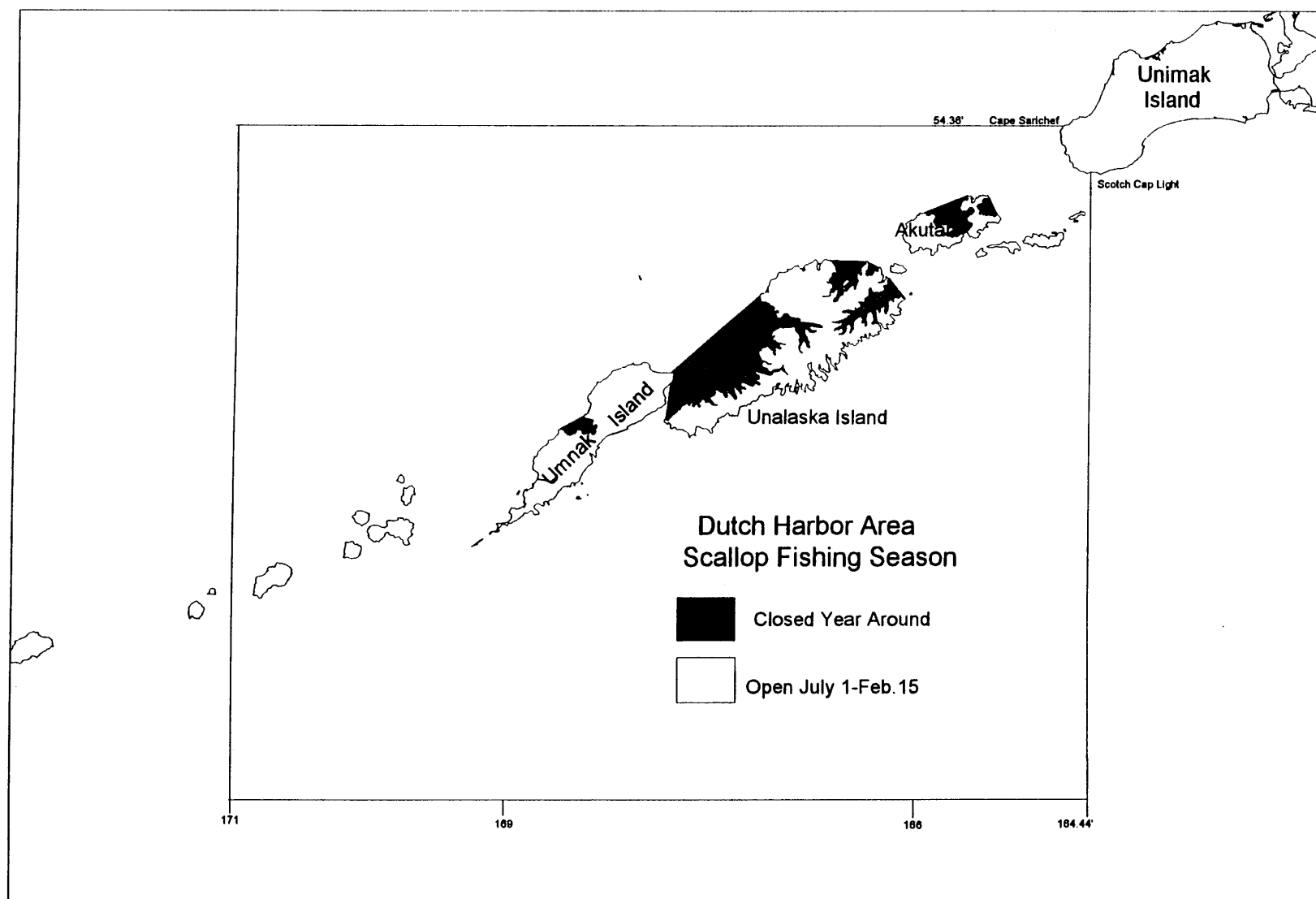


Figure 6-8. Dutch Harbor scallop fishing registration area and closed waters.

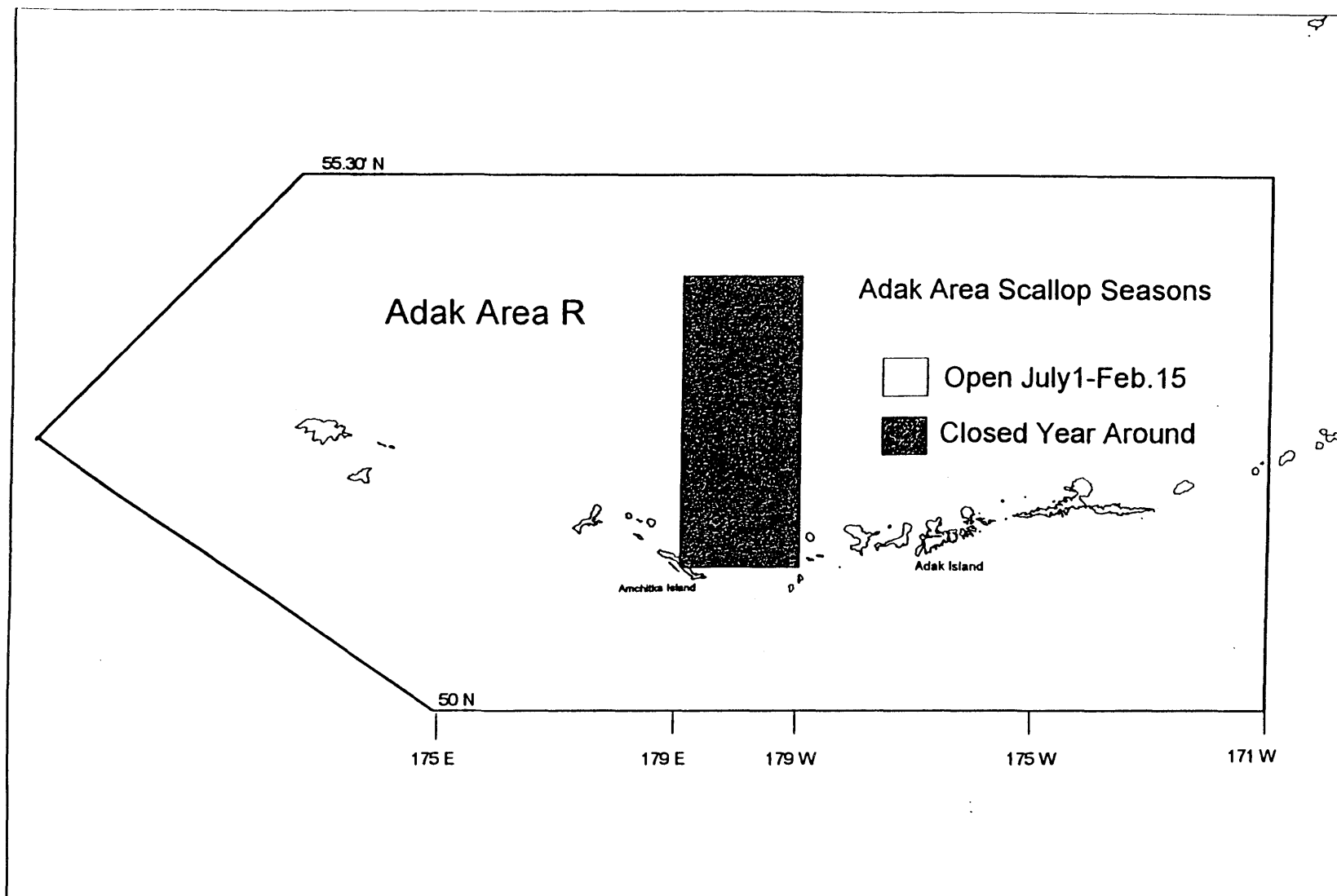


Figure 6-9. Adak scallop fishery registration area and closed waters.

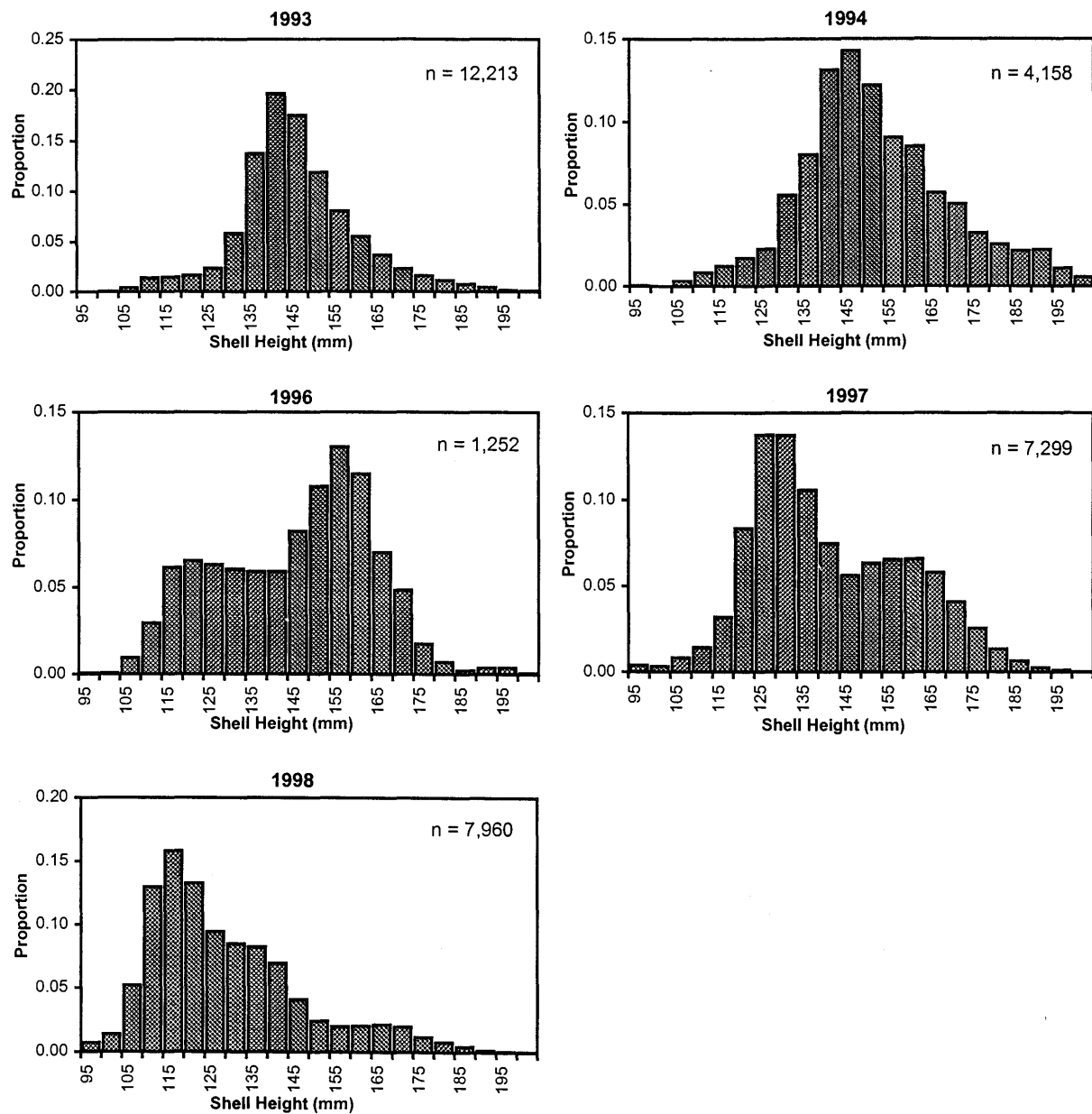


Figure 6-10. Shell height distribution observed in the retained scallop catch, Northeast District, Kodiak Area, 1993-1998.

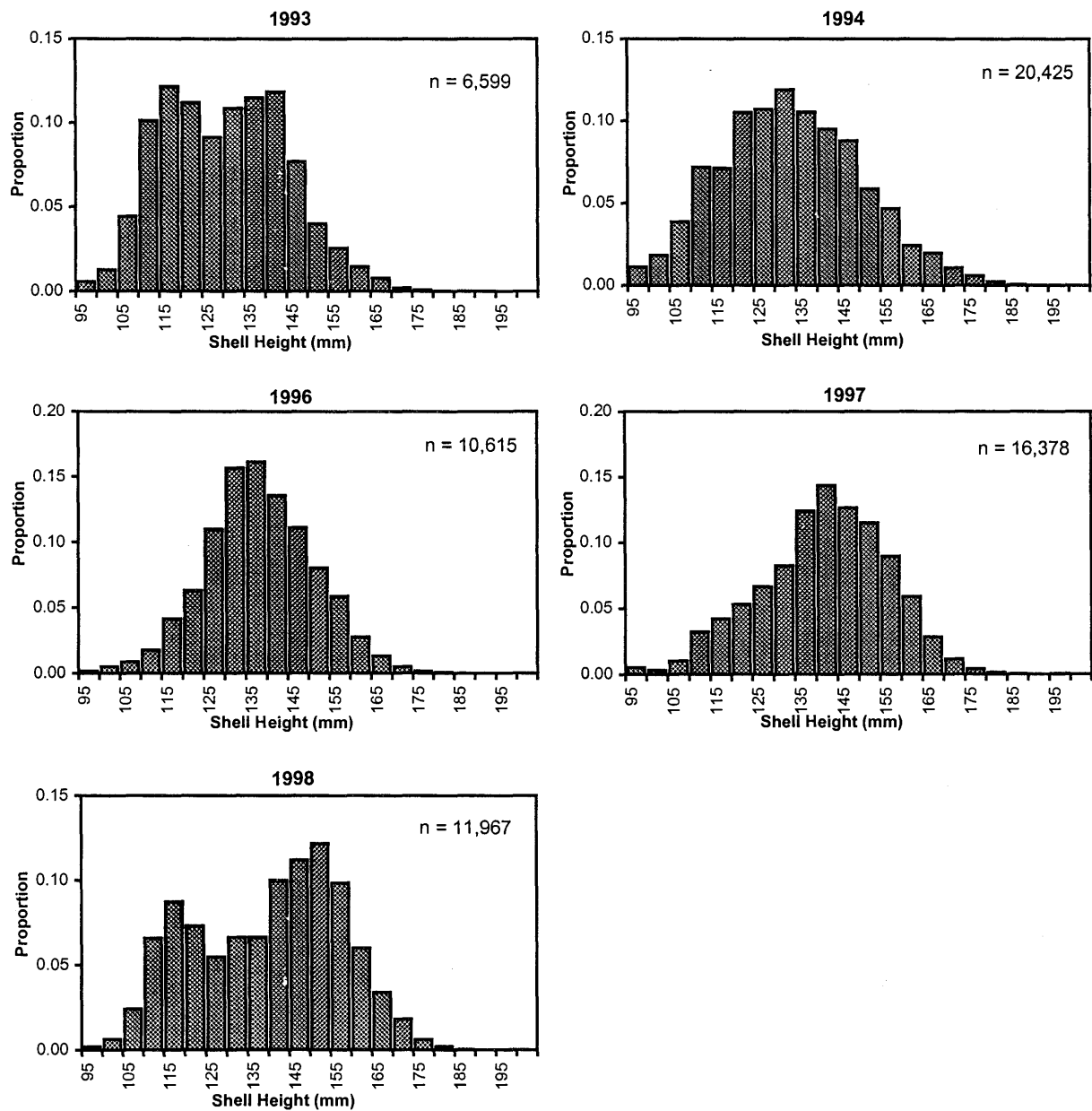


Figure 6-11. Shell height distribution observed in the retained scallop catch, Shelikof District, Kodiak Area, 1993-1998.

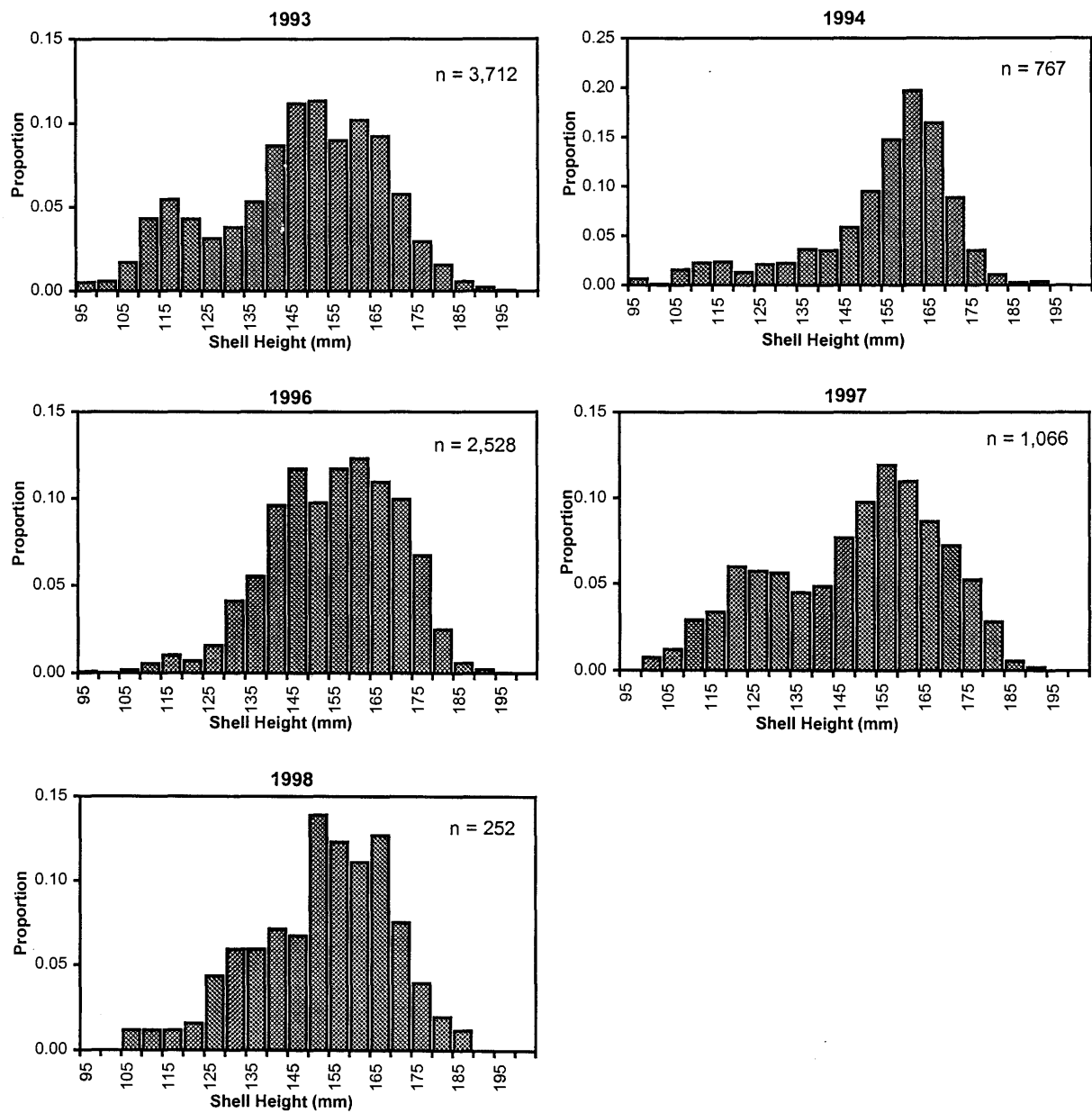


Figure 6-12. Shell height distribution observed in the retained scallop catch, Semidi District, Kodiak Area, 1993-1998.

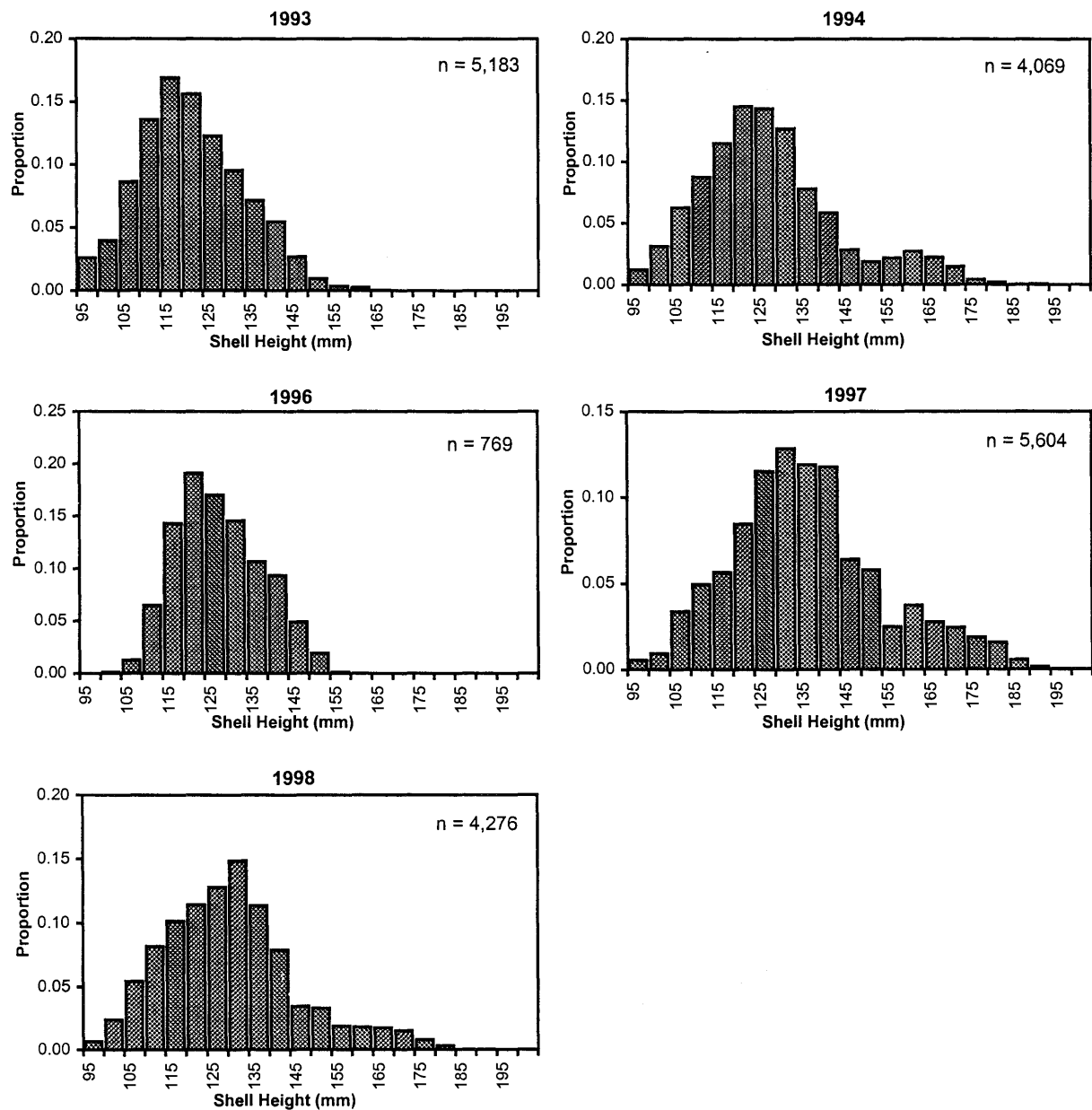


Figure 6-13. Shell height distribution observed in the retained scallop catch, Alaska Peninsula Area, 1993-1998.

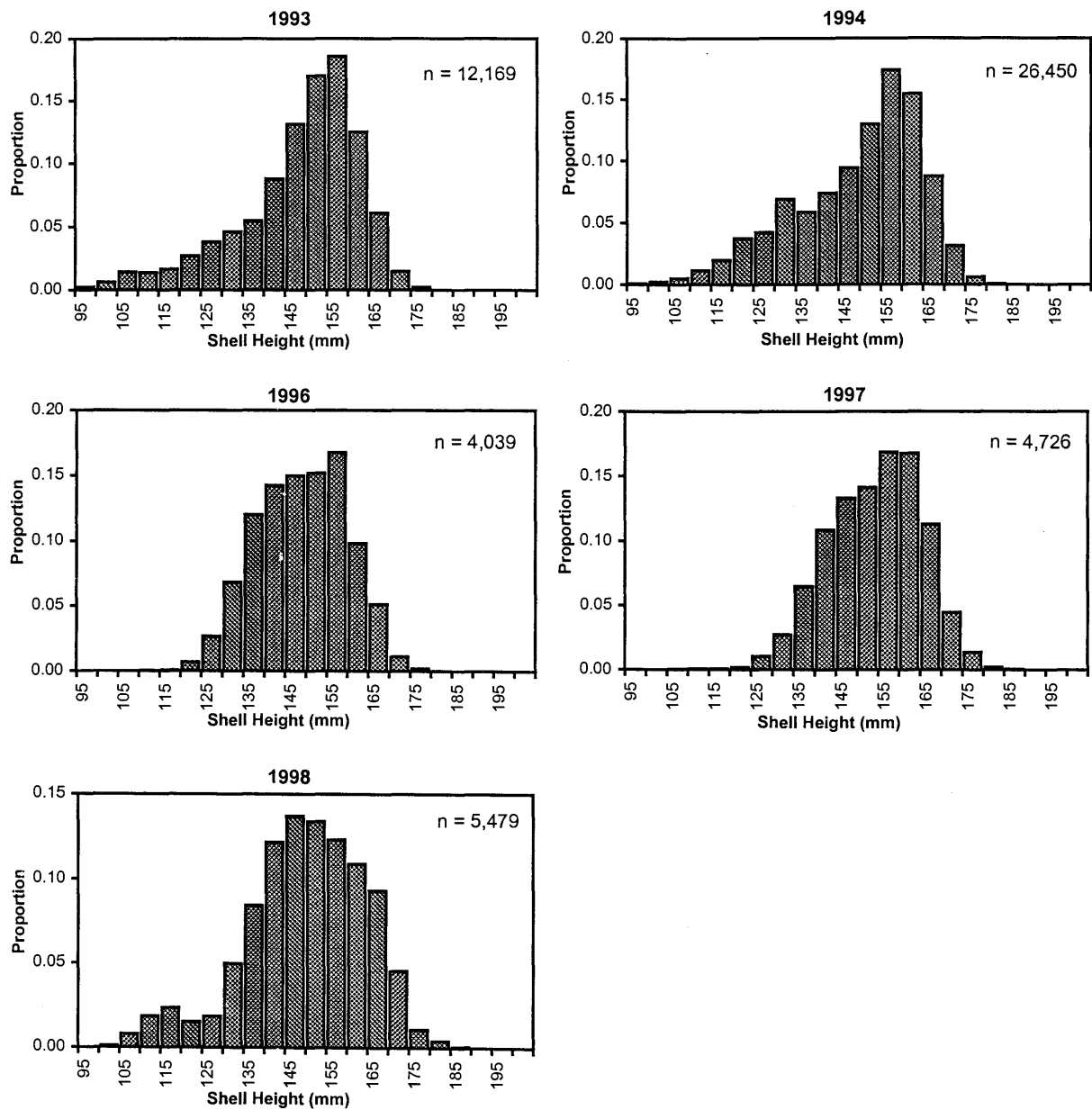


Figure 6-14. Shell height distribution observed in the retained scallop catch, Bering Sea Area, 1993-1998.

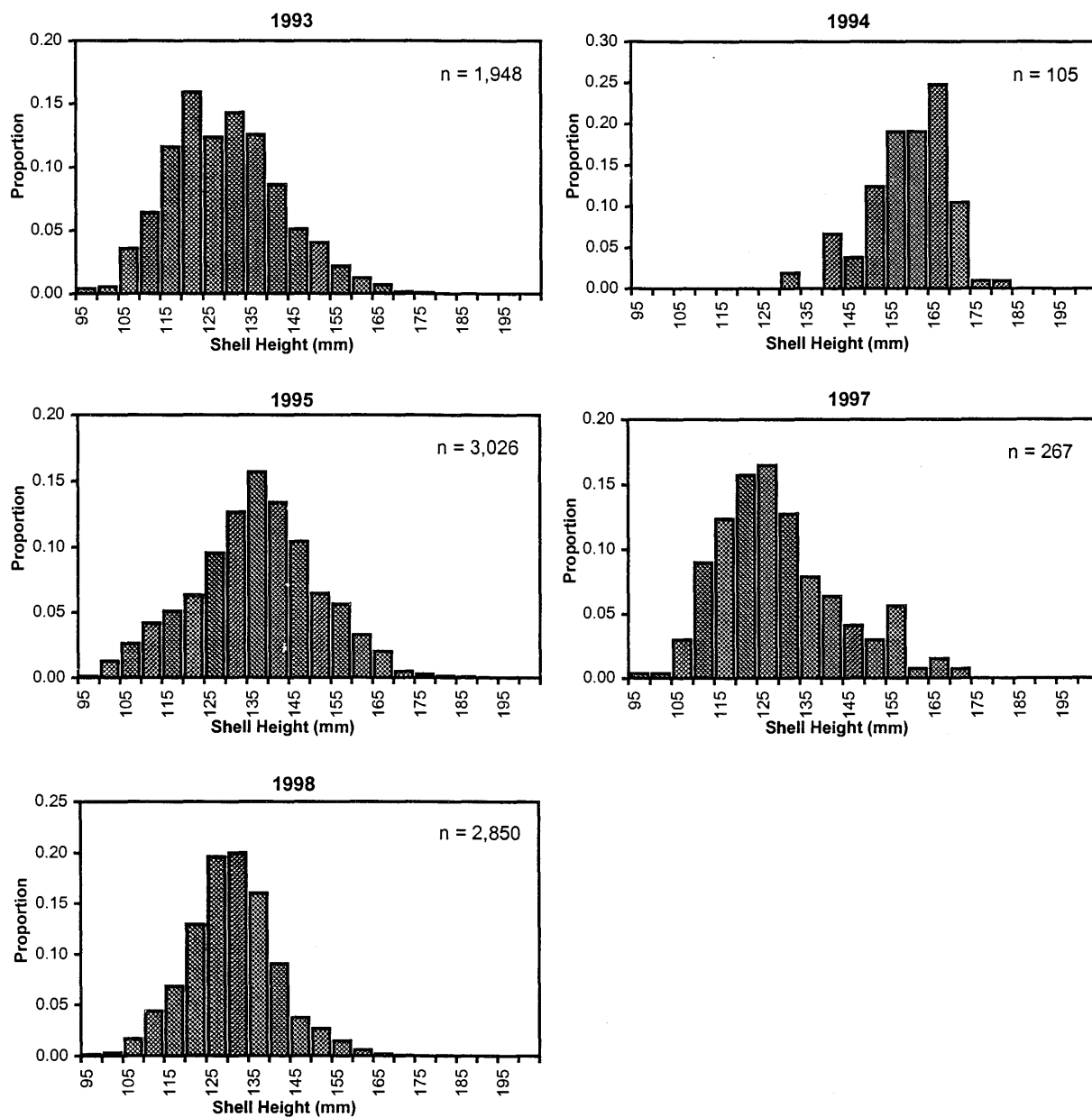


Figure 6-15. Shell height distribution observed in the retained scallop catch, Dutch Harbor Area, 1993-1998.

STATE OF ALASKA
MANDATORY SHELLFISH ONBOARD OBSERVER PROGRAM

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INTRODUCTION

In April 1988 the Alaska Board of Fisheries (BOF) adopted regulations requiring onboard observers on all vessels which process king crabs and Tanner crab *Chionoecetes bairdi* within Alaskan waters. The observer requirement was prompted by Alaska Department of Fish and Game (ADF&G) reports, which suggested that illegal processing of undersized and female crabs by at-sea processors was occurring. The reports showed consistently higher production rates by catcher-processors (C/P) compared to catcher-only vessels (F/V). These regulations resulted in creation of the Mandatory Shellfish Onboard Observer Program (Observer Program), which first deployed observers in the September 1988 Bristol Bay red king crab *Paralithodes camtschaticus* fishery. The primary goals of the program were to determine the legality of retained crabs, collect catch composition data from sampled crab pots, and collect shell size, age, and condition information from the delivered product.

In the spring of 1990 the BOF made regulations which broadened mandatory observer coverage to include vessels processing snow crab *Chionoecetes opilio*. This change was made due to reports of undersized Tanner crabs being processed and labeled as snow crab. The BOF also defined observer qualification standards, observer and contractor conflict of interest guidelines, and observer duties and responsibilities. In the fall of 1991 the BOF adopted new regulations concerning observer certification and decertification.

During the spring 1993 BOF meeting, the weathervane scallop *Patinopecten caurinus* fishery was designated a high-impact emerging fishery for which the board developed a fishery management plan. One adopted regulation mandated that ADF&G institute an observer program for the scallop fishery. Implemented on June 27, 1993, the Scallop Observer Program primary goals are assessing scallop population dynamics and documenting the impact on other fisheries through analysis of data from dredge samples.

Additional changes were adopted by the Observer Program from 1993 to 1997. In 1993, the requirement of carrying shellfish observers as a condition of the permit for all vessels fishing for hair crab *Erimacrus isenbeckii* in the Bering Sea was enacted. Regulations enacted in 1994 required shellfish observers, as a condition of the fishing permit for all registration areas, onboard vessels targeting grooved Tanner crab *Chionoecetes tanneri*, triangle Tanner crab *Chionoecetes angulatus*, scarlet king crab *Lithodes couesi*, or *Paralomis multispina*. Regulations requiring shellfish observers on all vessels fishing for king crabs in the Aleutian Islands registration area were enacted in 1995. Also, separate certifications for crab and scallop observers were put into regulation in 1997 to conform to the policy the department had already established.

The Observer Program was further strengthened by BOF actions during the March 1999 meeting. Most significantly, the board granted the department full authority and responsibility for deploying observers on any vessel participating in Bering Sea and Aleutian Islands crab fisheries for management and data gathering needs. Funding for some observer deployments through department cost recovery fishing was also approved. The BOF also established an industry oversight group to work with the department and report to the BOF on crab observer program

issues. The use of department seasonal employee observers could also occur under the changes enacted in 1999.

Although Observer Program regulations apply statewide, activities have focused on the Bering Sea and Aleutian Islands crab fisheries, where all at-sea processing of king and Tanner crabs occurs. The policy of ADF&G is that all observer activities for a fishery be handled by the management office responsible for that fishery. Consequently, a vast majority of the crab observer activity has been handled by the Observer Program staff in Dutch Harbor. Scallop observer activity has been more dispersed. The Dutch Harbor office conducts briefings and debriefings of observers deployed to the Bering Sea, Dutch Harbor, Kodiak, and Alaska Peninsula scallop registration areas. Area ADF&G offices in Kodiak, Cordova, and Yakutat also briefed and debriefed observers for various scallop fisheries managed from those offices.

SHELLFISH OBSERVER PROGRAM GUIDELINES

Shellfish Observer Program guidelines were originally defined by the BOF in 1988 and have been refined over time. Guidelines defining the responsibilities of each group (ADF&G, contractors, observers, and vessels) involved in the Observer Program are in regulation and can be found in the 1999-2000 Statewide Commercial Shellfish Regulation handbook under **5 AAC 39.645. SHELLFISH ONBOARD OBSERVER PROGRAM.**

Alaska Department of Fish and Game

ADF&G is responsible for establishing observer qualifications, conflict of interest standards, and sampling procedures. The department also establishes contractor conflict of interest standards, as well as certification and decertification of contracting agents. The department is further charged with review and approval of observer training programs, observer testing, certification, decertification, briefings, debriefings, analysis of observer data, progress reports and providing all appropriate data forms and supplies to observers.

Contractors

Observer contracting companies are required to hire, train, and deploy observers. Contractors also provide all observer logistical support including food, accommodations, sampling equipment, and transportation. Contractors secure contracts directly with vessel owners/operators.

Observers

Observer qualifications include a minimum of a Bachelor degree in the sciences of biology, any branch of biology, or limnology; or a valid National Marine Fisheries Service (NMFS) observer

certification; or employment history demonstrating the ability, once trained, to perform the duties of a shellfish observer.

Observer candidates are required to undergo ADF&G approved training and pass a written exam. Contractors have conducted training of observers in the past, however, most shellfish observer training since 1991 has been conducted by the staff of the North Pacific Observer Training Center (OTC) in Anchorage. The OTC has trained all shellfish observers since 1993. The facility is operated through the University of Alaska, Sea Grant program and trains shellfish observers for the ADF&G program as well as groundfish observers for the NMFS program.

Observers must also pass a practical training exam administered by Observer Program staff in Dutch Harbor. Observers are required to adhere to a detailed set of standards outlined in regulation to ensure the Observer Program deploys only professional biologists. Observers must not have a financial interest in the fishery or vessel to which they are assigned. Observers are limited to no more than 90 days of duty on a specific vessel during any 12 month period. Trainee Observers have 180 days to gain their certification, and certified observers who are inactive for 12 consecutive months lose their certification. To regain certification they must be retrained and re-tested.

Vessels

Regulations require the cost of observers to be borne by the shellfish industry or by the department through cost recovery fishing. Vessel owner/operators are required to procure and pay for observers through a qualified contractor and provide food and accommodations equal to that of the vessel's crew. The vessel must also provide the observer a safe work area, necessary totes to hold the contents of sampled pots, and the opportunity to adequately sample the catch according to ADF&G requirements. Fishing effort and harvest data must be provided daily to the observer, and access to communication equipment must also be provided to the observer by the vessel.

OBSERVER DUTIES

Catcher-Processor Vessel

Observers assigned to catcher-processors are required to obtain daily catch records and report production to ADF&G and conduct various sampling duties. These duties include daily biological sampling of 100 retained crabs for size and shell age, weighing an assigned number of crabs to determine average weight, and sampling a specified number of crab pots to identify pot contents, depth fished, soak time, pot location, and document the incidence of bycatch species. New sampling duties include examining non-retained crabs for fishing related injuries, and also recording the elapsed time that non-retained crabs are on the vessel before being returned to the sea. To monitor compliance of size and sex regulations, observers randomly sample 600 retained crabs throughout the day to determine legal status.

Floating Processor Vessel

Observers assigned to floating processors (F/P) sample the harvest of catcher-vessels delivering to that floating processor. Observers conduct confidential interviews with vessel operators to determine fishing effort and location. They also conduct random legal tally sampling of 600 crabs and sample 100 crabs for size and shell age from each delivery. Observers determine average crab weight by counting the number of crabs in three brailers of known weight.

Catcher-Only Vessel

The duties of an observer assigned to a catcher-only vessel are similar to those on a catcher-processor. Observers sample a specified number of pots on a daily basis to identify pot contents and document the incidence of bycatch species. They also record fishing locations and monitor fishing activities. Daily catch records, fishing efforts, and sampling rates are reported to ADF&G. At each delivery, observers sample 100 crabs per retained species for size and shell age, obtain average crab weight by counting the number of crab in three brailers of known weight and monitor compliance of size and sex regulations by randomly sampling 600 crabs during delivery.

In addition to these normal duties, observers aboard all three vessel types are assigned numerous special projects ranging from specimen and morphometric data collection to documenting observations of endangered bird species.

Observers are also instructed in evidence collection, handling procedures, and proper documentation in the event a potential violation is encountered. The Alaska Department of Public Safety, Fish and Wildlife Protection Division (FWP) will later interview them, and a written statement may be required. Observers are also required to testify in court when necessary.

PROGRAM REVIEW

Tracking of observer deployments and vessel assignments for all shellfish fisheries in this report is by calendar year. Observer deployments are determined by the total number of days from their briefing until their debriefing. Observer-days are converted to observer-months where one observer-month is equivalent to 30 observer-days.

Vessel Effort and Observer Coverage

Observer activity increased during the first three years of the program (Table 7-1 and Figure 7-1) then experienced a dramatic increase in activity in 1991. This is the result of a BOF decision requiring observer coverage of the Bering Sea snow crab fishery. An increase in the number of at-sea processing vessels also contributed to the increased demand for observers. During the

1992 season, the expanding trend reversed as quotas in the Bering Sea Tanner crab fisheries declined and seasons shortened along with fewer catcher-processors participating in the Bristol Bay red king crab fishery.

The number of at-sea processors participating in the Bering Sea and Aleutian Islands crab fisheries continued to decline from 51 vessels (32 catcher-processors and 19 floating processors) in 1992 to 22 vessels (11 catcher-processors and 11 floating processors) in 1999. Many catcher-processors have left U.S. fisheries, some having been sold to Russian companies. The decrease in observer catcher-processor activity was partially offset by additional observer coverage requirements enacted by the BOF. Beginning in 1993, all vessels fishing for Bering Sea hair crab or scallops were required to carry an observer as a condition of the fishing permit. During 1994, all vessels fishing for grooved Tanner crab, triangle Tanner crab, scarlet king crab, and *P. multispina* were also required to carry an observer as a condition of the fishing permit. In 1995, regulations requiring observers on all vessels fishing for king crabs in the Dutch Harbor and Adak registration areas were enacted and in 1996 the BOF combined these two areas to form a single Aleutian Islands king crab registration area. The trend of increasing observer activity since 1994 can be attributed to the requirement of observers on all vessels fishing for king crabs in the Aleutian Islands area.

The decline of observer activity in specific fisheries can be attributed to the decreased number of catcher-processor vessels, reduction of fisheries quotas, closure of fisheries, and the falling prices paid to the fishermen for their harvest. In 1996, ADF&G established quotas for grooved Tanner crab fisheries by registration area, which previously did not have harvest limits. With the introduction of these quotas, no vessels targeted grooved Tanner crab in 1997, 1998 or 1999. Due to the depressed nature of Bering Sea Tanner crab stocks, a commercial fishery has not occurred since 1996. The quotas for the Bering Sea hair crab fishery have also continued to decline resulting in shorter fishing seasons. The falling prices paid to fishermen for harvested shellfish have made many fisheries economically unfeasible to vessels required to bear the costs of carrying an observer.

An amendment to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) provided for the development and implementation of a Community Development Quota (CDQ) program for crab fisheries which take place in the Bering Sea and was incorporated into the existing state managed shellfish fisheries in 1998. Currently, there are six separate CDQ groups designated for this area. Fisheries covered by the CDQ program are Bristol Bay red king crab, Norton Sound red king crab, St. Matthew blue king crab *Paralithodes platypus*, Pribilof red and blue king crab, and the Bering Sea Tanner and snow crab fisheries. Two CDQ fisheries occurred during 1999 after the closure of the open access fisheries. One observer per CDQ group was required for the snow crab season but 100% observer coverage was required for the Bristol Bay red king crab season. Quotas for each CDQ fishery are established as a percentage of the total harvest from the open access fishery. Historic summaries of 1988-1999 vessel and observer activity, by fishery, are presented in Tables 7-2 through 7-13.

1999 OBSERVER DEPLOYMENT ACTIVITY BY FISHERY

During the 1999 calendar year, observer activity totaled 152 trips and 148.5 months at sea. (Tables 7-1 and 7-13).

Aleutian Islands Golden King Crab

The Aleutian Islands golden king crab *Lithodes aequispinus* fishery begins September 1 each year and continues through August 31 of the following calendar year, unless the fishery is closed by emergency order. The observer deployments summarized for this fishery are for the calendar year 1999, a period encompassing parts of two fishery seasons which took place during the year. During 1999, the portion of the Aleutian Islands registration area west of 174° West longitude did not close, while the eastern portion opened September 1, and was closed by emergency order on October 25. Observers were deployed on one catcher-processor, and 15 catcher-only vessels, which totaled 53.5 months of observer deployments.

Bering Sea Snow Crab

This fishery opened on January 15 with a quota of 186.2 million pounds. It closed March 22 with a harvest of 184.5 million pounds. Observers were deployed on 10 catcher-processors and 11 floating processors, accounting for 50.0 months of observer time.

The 1999 Bering Sea CDQ snow crab fishery was open during the open access fishery but the 21 catcher-only vessels and one floating processor participating did not begin until after the closure of the open access fishery. Those observers deployed on these 22 vessels accounted for 11.8 months of observer deployments. A total of 9.67 million pounds was harvested during this fishery.

Bristol Bay Red King Crab

This fishery opened October 15 with a quota of 10.1 million pounds. The fishery was closed by emergency order on October 20 with a harvest of 11.1 million pounds. Observers were deployed on eight catcher-processors and one floating processor, spending a total of 4.4 months at sea.

The 1999 Bristol Bay CDQ red king crab fishery was open during the open access fishery but did not commence until after the closure of the open access fishery. Observers were deployed on 10 catcher-only vessels accounting for 2.8 months of observer deployments. The fishery closed on November 8 with a total harvest of 579,258 pounds.

Bering Sea Hair Crab

The fishery opened on October 30 with a quota of 283,000 pounds. The fishery closed by emergency order on December 7 with a harvest of 221,062 pounds. Observers were deployed on eight catcher-only vessels, logging 5.3 months at sea.

Weathervane Scallop

The 1999 scallop fisheries opened in federal and state waters on July 1. Efforts remained low in all registration areas in 1999 because the majority of the permitted scallop vessels had returned to the East Coast of the United States in 1996. Statewide, observers were deployed on eight unique scallop vessels completing 27 trips in six different scallop registration areas. These deployments totaled 20.7 months at sea (Tables 7-13 and 7-15). Table 7-14 is a summary of observer activity in the scallop fisheries from 1993-1999. The Dutch Harbor ADF&G office is responsible for managing the Bering Sea, Dutch Harbor and Adak registration areas. Fishery harvest information for other scallop registration areas is available from the ADF&G office responsible for managing the respective areas.

Alaska Peninsula

Observers were deployed on five scallop vessels during this calendar year, with a total deployed time of 3.3 months. One observer was briefed and two observers were debriefed in Dutch Harbor for this fishery.

Bering Sea

The Bering Sea scallop season began on July 1. Observers were deployed on two scallop vessels during this fishery, totaling four trips and spending 3.9 months at sea. The season was closed by emergency order on August 30 to avoid exceeding the Tanner crab bycatch limit. There were two briefings and four debriefings conducted in Dutch Harbor for this fishery.

Dutch Harbor

The Dutch Harbor scallop season also began on July 1, but no vessels participated in the fishery until September. The fishery closed on October 1. One observer was deployed for one trip on the single vessel participating in this fishery for a deployment time of 0.5 months. The observer was briefed and debriefed in Dutch Harbor for this fishery.

Kodiak

Observers were deployed on six scallop vessels during this fishery, for a total of nine trips and spending 6.7 months at sea.

Prince William Sound

Observers were deployed on two scallop vessels for two trips with a total deployment time of 0.4 months in this fishery.

Yakutat /District 16

Observers were deployed on three scallop vessels during the July fishery, for a total of four trips and 5.9 months at sea. District 16 has a separate guideline harvest level from that of the rest of the Yakutat registration area, but is included in this registration area.

Miscellaneous Fisheries

Miscellaneous fisheries have historically included small emerging fisheries where an observer is required as a condition of the fishing permit for vessels to participate. Many of these permit fisheries have targeted previously unexploited shellfish stocks where little or no data is available for proper management. Some of the miscellaneous fisheries occur in sensitive habitat utilized by juvenile stages of commercially important species. Management of these fisheries rely upon observer collected data to determine the impacts of fishing activities conducted in these areas. Miscellaneous fisheries requiring observer coverage did not occur in 1999.

OBSERVER BRIEFING AND DEBRIEFING ACTIVITY

During the 1999 calendar year, Observer Program staff in Dutch Harbor conducted 105 shellfish observer briefings and 179 debriefings, which includes mid-trip debriefings (Figures 7-1 and 7-2).

During the first four years of the Observer Program, briefing and debriefing activity was high during the fall, winter, and spring months corresponding to the commercial crab fishing seasons in the Bering Sea and Aleutian Islands. Observer activity in 1994 through 1996 increased substantially during the summer months due to Dutch Harbor/Adak/Aleutian Islands area king crab fisheries, the deep water Tanner crab fisheries, and the scallop fisheries. The 1997 activity was lower, primarily because no vessels fished for deep water Tanner crabs. Observer Program activity increased in 1998 due to the addition of observer coverage requirements for the CDQ fisheries. Activity decreased in 1999 due to fewer fishery seasons and lower guideline harvest levels (GHL). This resulted in fewer boats needing observer coverage for shorter periods of time. The numbers of briefings and debriefing sessions for the years 1991-1999 are presented in Tables 7-1 and 7-16 and illustrated in Figure 7-1.

Observer Exams, Certification, and Decertification

Since the inception of the Observer Program, 27 certification exams have been held, attended by 476 candidates, of which 415 passed (87%). The OTC in Anchorage has conducted 18 of these training courses since 1991, accounting for 226 students. At the end of 1999 there were 35 certified observers remaining in the crab Observer Program. Shellfish Observer Program exam and candidate information is summarized in Table 7-17.

During 1999, one crab shellfish observer training class was held at the OTC in September. A total of nine individuals attended training and eight passed the written exam. The training practicum exam was held in Dutch Harbor following the training class. A total of seven candidates participated and passed the practicum exams. All candidates were issued shellfish observer trainee permits. Two observers subsequently received full certification by the end of 1999 and the remaining six observers were still in trainee status. Certification data by year since inception of the Observer Program is presented in Table 7-17.

During 1999, 18 crab observers were decertified for 12 months of inactivity or for the expiration of their 180 day trainee permit, and one certified observer was decertified for non-compliance with Shellfish Observer Program standards.

One scallop observer training class was held at the OTC in June of 1999. Eight candidates attended training and were issued trainee permits. Six observers subsequently received full certification by the end of 1999, one was not deployed by his contractor and his trainee permit expired, and one observer trainee was not certified during the training period. Certification data by year since inception of the Scallop Observer Program is presented in Table 7-18.

Five scallop observers were decertified in 1999 for 12 months of inactivity and two for the expiration of their 180 day trainee permit.

Evidence Collection

Observers collected evidence pertaining to potential illegal activities on eight percent of the trips conducted during the 1999 fisheries. The percentage of trips where evidence was collected was the lowest since the inception of the observer program. All fisheries had lower incidences of evidence collection except the Bristol Bay red king crab fishery. Evidence collection by observers for the years 1991-1999 is summarized in Table 7-19 and Figures 7-3 through 7-7.

For the years 1991-1995, most evidence was collected from Bering Sea Tanner crab fisheries. In 1996 and 1997, the Aleutian Islands golden king crab fishery accounted for most of the evidence collected by observers. In 1998, most evidence collected was divided between the Aleutian Island golden king crab and Bering Sea snow crab fisheries. In the Aleutian Islands golden king crab fishery, the percentage of deployments where evidence was collected dropped from 31 percent in 1998 to only three percent in 1999; whereas the Bering Sea snow crab fishery accounted for 50 percent of *all* evidence collected by observers in 1999. Additionally, 70 percent

of the incidences that required evidence collection by observers was the documentation of the retention of sublegal male, female, or illegal crab species.

Data Analysis

The considerable biological data collected by shellfish observers is summarized annually by the Shellfish Observer Program Database staff. A summary and analysis of these data is available in a separate Regional Information Report. The most recent report is entitled "1997 Shellfish Observer Program Database Summary Report." (RIR No. 4K98-50). The report includes all fisheries with crab observer coverage in 1997.

PROBLEMS WITH THE OBSERVER PROGRAM

Some earlier problems with the Observer Program have been resolved through changes in regulations and better cooperation between industry, observer contractors, observers, and ADF&G. However, the problems inherent to the current system have not been sufficiently addressed. Fishing vessel companies now negotiate directly with observer contractors for observer services, which creates the potential for conflict of interest. The competitive pressure on contractors to procure and maintain contracts with fishing vessel companies creates incentives for vessels to manipulate the system to their advantage. The pressure on the contractors to provide observers who meet the needs of their clients can influence contractor hiring practices. A federal Grand Jury, brought forward by NMFS enforcement agents, was convened in Seattle to investigate a vessel company and observer contractor working to provide "user friendly" observers for their vessels in addition to other observer issues, but the issue is unresolved at this time.

The current system can place the observer in a position of potential compromise between ADF&G requirements (which include documenting illegal activities and collecting evidence) and possible pressure from the vessel and contractors to ignore violations. This could increase profits to the vessels and ensure the contractor future contracts with the fishing vessel company. Observer profit sharing incentives with their contractor company could further exacerbate the conflict of interest built into the system.

Prior to observer unionization, competitive pressures had resulted in reduced observer salaries and contributed to the high turnover rate of observers. Low observer morale spanning the years prior to observer unionization was principally caused by decreases in observer pay and deploying new, trainee observers over experienced observers. This low morale may have adversely influenced the quality and integrity of the observer data.

These factors led observers in the state shellfish and federal groundfish observer programs to unionize under the Alaska Fishermen's Union in 1997. Collective bargaining agreements with the five observer contractors were finalized and unionized observers completed all observer deployments for 1998. Also, new regulations enacted by the BOF in 1996 require that certified

observers perform 65 percent of a contractor's annual observer deployment days. These developments have contributed to improved observer morale and retention of experienced observers.

The same five independent contractors that provide shellfish observers also supply observers for the NMFS groundfish observer program. NMFS still seeks to eliminate the direct negotiations between the observer contractors and the fishing vessel companies and the inherent conflict of interest in the current system. The intended "arms length" relationship between the vessels and contractors does not exist and all proposals to create this desired relationship have been repealed or rejected to date.

1999 BOARD OF FISHERIES ACTIONS, STATE FUNDED CRAB OBSERVER PROGRAM

The BOF addressed several proposals for the shellfish observer program at the triennial statewide king and Tanner crab meeting in March 1999. The most significant proposal gives the department full authority and responsibility for deploying observers on any vessel participating in the Bering Sea and Aleutian Islands crab fisheries as necessary for fishery management and data gathering needs. This will give the department the flexibility it needs to collect at-sea data from unobserved or under-observed fisheries, aid the department's research and management programs and ensure the state's compliance with provisions in the MSFCMA and the federal Fishery Management Plan (FMP) for the Bering Sea/Aleutian Islands king and Tanner crab fisheries.

The department's proposal to fund all crab observer deployments from cost recovery fishing was modified at the March meeting. The BOF and the crab industry were not comfortable with the department collecting all the revenue for the program from the sale of crab. Representatives of the crab fishing industry testified that they were willing to continue to pay for observer coverage. The department agreed to reduce the amount of cost recovery harvest from \$2.6 million to \$650,000 for fiscal year 2000 (FY00). The money would be collected in the fall of 1999 to pay for observer coverage beginning in the fall of 2000. The test fish authorization for the program included an Administrative Clerk III position and new seasonal Fishery Biologist I positions.

The BOF also formed an Initial Oversight Committee for the crab observer program composed of members of the crab industry at the March meeting. The 15 member permanent committee was approved by the BOF at their October 1999 Work Session. The committee is charged with making recommendations to the BOF on the crab observer program, advising and interacting with the department on observer issues, and working with the department in developing program receipts requests to the State Legislature. The department met four times with the initial committee prior to the BOF October Work Session. During the June meeting the department presented various scenarios for the cost recovery fishing. The recommendation from the initial committee was to conduct the cost recovery fishing targeting Bristol Bay red king crab after the completion of the 1999 open access fishery.

1999 Cost Recovery Charter

Vessel charter bids were solicited, as were bids from crab processors, to purchase the cost recovery red king crab. The *F/V Sea Warrior* was the low bidder for the cost recovery charter (\$2,400 per day + bait) and Osterman Fish in Unalaska was the high bidder for purchasing the crab at \$6.32 per pound. The charter began on October 25 and was completed on November 10. There were two landings totaling 105,934 pounds of red king crab. Crab sales totaled \$669,502.88. The 1999 crab observer program cost recovery program is summarized in Tables 7-20 and 7-21.

SUMMARY

Dutch Harbor was again the focal point of the Observer Program during 1999. All observer deployments in the crab fisheries were managed through the Dutch Harbor office. Observers briefed and debriefed in Dutch Harbor for scallop fisheries were deployed in three different scallop registration areas. All other observers deployed in scallop fisheries were briefed and debriefed by the local ADF&G area office that manages each respective fishery.

One crab shellfish observer training class was held at the OTC in September. Nine individuals attended training and eight passed the written exam and practicum exams. All eight candidates were issued shellfish observer trainee permits. Two observers subsequently received full certification by the end of 1999 and the remaining six observers remain in trainee status at this time. A total of 41 individuals remained in the crab observer program at year's end.

Eight scallop observers were trained in one class at the OTC in 1999. Six of these received full certification by the end of 1999. A total of 10 individuals remained in the scallop observer program at year's end.

Observers collected evidence on eight percent of all shellfish observer trips during the 1999 fishing year. The largest portion of evidence, 50 percent, was collected by observers deployed in the Bering Sea open access snow crab fishery. Most incidences requiring evidence collection pertained to the retention of sublegal male, female, or illegal crab species.

Problems with the Observer Program continue to center around the original third party contractor system of vessels procuring observers. The direct negotiation with observer contractors for observer services creates a serious potential for conflict of interest and incentives for vessels to manipulate the system to their advantage. Under existing regulations, unobserved and under-observed fisheries have hampered the department's research and management objectives. BOF actions at the March 1999 meeting will enable the department to deploy observers on any vessel participating in the Bering Sea and Aleutian Islands crab fisheries, as necessary, for fishery management and data gathering needs. These regulations will go into effect July 1, 2000.

Literature Cited

Alaska Department of Fish and Game (ADF&G). 1998. Summary of the 1997 mandatory shellfish observer program database. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K98-50.

Table 7-1. Summary of vessels, observer trips, number of deployed observers, number of certified observers at year's end, observer months at sea, number of active contractors, and number of briefings and debriefings in Dutch Harbor from inception (first briefing September 20, 1988) through December 31, 1999.

Year	C/P	Vessels ^a			Observer Trips	Deployed Observers	Certified @ Year's End ^b	Observer Months	Brief ^c	Total Debrief ^d	Active Contractors
		F/P	F/V	S/V							
1988	21	6	0	0	46	28	80	31.4	43	42	6
1989	22	12	0	0	124	53	98	124.0	127	123	7
1990	26	15	0	0	140	61	119	163.5	142	137	7
1991	33	18	0	1	282	105	99	352.2	281	370	6
1992	32	19	2	0	225	100	103	280.3	221	310	7
1993	29	21	14	11	235	80	62	216.8	181	231	7
1994	24	17	19	12	185	74	83	178.8	152	198	7
1995	21	15	50	8	211	91	77	213.0	205	273	5
1996	16	13	38	5	209	82	75	250.5	190	301	5
1997	15	11	30	6	157	71	72	184.4	135	213	5
1998	13	11	44	8	186	62	56	203.1	156	226	5
1999	11	11	42	8	152	48	46	148.5	105	179	4

^a Unique vessels requiring observer coverage: C/P = Catcher Processor, F/P = Floating Processor, F/V = Catcher-Only Vessel, and S/V = Scallop Vessel.

^b Total number of observers who possess either a shellfish observer trainee permit or a full shellfish observer certification permit on December 31st of each year.

^c Includes some briefings for the next fishing year.

^d Includes mid-trip debriefings.

Table 7-2. Summary of registered vessels, total observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year ^a 1988.

Fishery	Registered Vessels		Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P				
Adak Golden King	13	4	20	43.5	21.3	67.8
Bristol Bay Red King	20	5	25	54.3	9.5	30.3
Dutch Harbor Golden King	1	0	1	2.2	0.6	1.9
Totals	34	9	46	100	31.4	100

^a September 1st, 1988 through December 31st, 1988.

Table 7-3. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, percentage of total observer months at sea by fishery, for the year 1989.

Fishery	Registered Vessels		Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P				
Bering Sea Golden King	2	0	2	1.6	1.5	1.2
Bering Sea Tanner	5	0	6	4.8	8.4	6.8
South Peninsula Tanner	0	2	2	1.6	0.7	0.6
Norton Sound Red King	7	0	7	5.7	1.6	1.3
Chukchi Sea Experimental	5	0	5	4.0	2.3	1.8
Dutch Harbor Golden King	4	2	8	6.5	7.7	6.2
St. Matthew Blue King	15	6	21	16.9	8.8	7.1
Bristol Bay Red King	18	12	30	24.2	16.6	13.4
Adak King	17	5	43	34.7	76.4	61.6
Totals	73	27	124	100	124.0	100

Table 7-4. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1990.

Fishery	Registered Vessels		Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P				
Bering Sea Tanner (Season A)	9	9	22	15.7	28.8	17.6
Bering Sea Tanner (Season B)	21	10	35	25.0	41.3	25.3
Norton Sound Red King	4	0	4	2.9	0.5	0.3
Dutch Harbor Golden King	6	1	7	5.0	8.4	5.1
St. Matthew Blue King	7	3	10	7.1	4.2	2.6
Adak King	11	2	27	19.3	60.7	37.1
Bristol Bay Red King	20	15	35	25.0	19.6	12.0
Totals	78	40	140	100	163.5	100

Table 7-5. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1991.

Fishery	Registered Vessels		Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P				
Bering Sea Snow Crab	26	17	149	52.8	216.8	61.6
Dutch Harbor Golden King	4	0	4	1.4	7.3	2.1
St. Matthew Blue King	9	2	11	3.9	5.3	1.5
Adak King	8	0	21	7.5	29.6	8.4
Bristol Bay Red King	25	14	39	13.8	19.8	5.6
Bering Sea Tanner Crab	26	12	53	18.8	68.8	19.5
Westward Region Scallops	1	0	5	1.8	4.6	1.3
Totals	99	45	282	100	352.2	100

Table 7-6. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea and, percentage of total observer months at sea by fishery for the year 1992.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P	F/V				
Bering Sea Snow Crab	30	16	0	106	47.1	156.3	55.8
Bering Sea Golden King	2	0	0	2	0.9	1.2	0.4
Norton Sound Red King	5	0	0	5	2.2	0.9	0.3
St. Lawrence Blue King	1	0	0	1	0.4	0.2	0.1
Dutch Harbor Golden King	5	0	0	6	2.7	7.2	2.6
St. Matthew Blue King	8	7	0	15	6.7	5.8	2.0
Bering Sea Hair Crab ^a	1	0	2	3	1.3	1.3	0.5
Bering Sea Tanner Crab	23	9	0	43	19.1	64.0	22.8
Adak King	8	1	0	20	8.9	32.8	11.7
Bristol Bay Red King	17	6	0	24	10.7	10.6	3.8
Totals	100	39	2	225	100	280.3	100

^a Catcher-only vessels volunteering to carry ADF&G staff personnel.

Table 7-7. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1993.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months	
	C/P	F/P	F/V ^a				Observer	Months
W. Aleutian Hair Crab	1	0	0	1	0.4	0.9	0.4	
Bering Sea Snails	1	0	3	5	2.1	5.5	2.5	
Bering Sea Surf Clam	0	0	1	1	0.4	0.7	0.3	
Bering Sea Snow Crab	25	21	0	63	26.9	93.8	43.3	
Bristol Bay Hair Crab	0	0	7	7	3.0	3.2	1.5	
Norton Sound Red King	0	1	0	1	0.4	2.0	0.9	
Pribilof Red King	2	2	0	4	1.7	1.8	0.8	
St. Matthew Blue King	3	4	0	7	3.0	3.5	1.6	
Adak King	5	0	0	12	5.1	18.8	8.7	
Bering Sea Tanner Crab	18	5	0	23	9.8	15.8	7.3	
Bering Sea Hair Crab	0	0	12	14	6.0	20.8	9.6	
Bristol Bay Red King	16	7	0	25	10.6	13.8	6.4	
Statewide Scallops	0	0	11	72	30.6	36.2	16.7	
Totals	71	40	34	235	100	216.8	100	

^a Catcher-only vessels required to carry onboard Shellfish Observers.

Table 7-8. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1994.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P	F/V ^a				
W. Aleutian Grooved Tanner	0	0	1	1	0.5	0.6	0.3
E. Aleutian Grooved Tanner	0	0	3	9	4.7	6.4	3.6
Bering Sea Grooved Tanner	0	0	4	4	2.1	4.9	2.7
Kodiak Grooved Tanner	1	0	0	1	0.5	0.7	0.4
S. Peninsula Grooved Tanner	2	0	0	2	1.0	1.4	0.8
Bering Sea Snow Crab	24	17	0	55	29.0	76.6	43.0
Dutch Harbor Golden King	0	1	0	2	1.0	1.6	0.9
Pribilof Red King	0	4	0	4	2.1	2.2	1.2
St. Matthew Blue King	6	1	0	7	3.7	3.6	2.0
Adak King	3	1	0	11	8.4	15.1	8.4
Bering Sea Tanner Crab	9	1	0	10	5.3	7.0	3.9
Bering Sea Hair Crab	0	0	10	12	6.3	15.2	8.5
Statewide Scallops	0	0	12	67	35.4	43.4	24.3
Totals	45	25	30	185	100	178.7	100

^a Catcher-only vessels required to carry onboard Shellfish Observers.

Table 7-9. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1995.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P	F/V ^a				
Bering Sea Octopus	0	0	3	3	1.4	1.0	0.5
Bering Sea Surf Clam	0	0	1	1	0.5	1.0	0.5
E. Aleutian Triangle Tanner	0	0	1	1	0.5	1.0	0.5
Bering Sea Grooved Tanner	0	0	8	16	7.6	19.5	9.2
W. Aleutian Grooved Tanner	0	0	3	4	1.9	4.9	2.3
E. Aleutian Grooved Tanner	0	1	7	15	7.1	23.2	10.9
Southeast Grooved Tanner	1	0	0	1	0.5	0.2	0.1
S. Peninsula Grooved Tanner	1	0	8	16	7.6	11.3	5.3
Bering Sea Snow Crab	19	15	0	50	23.7	51.4	24.1
Dutch Harbor Golden King	1	0	16	19	9.0	20.0	9.4
Pribilof Red King	1	0	0	1	0.5	0.4	0.2
St. Matthew Blue King	1	4	1 ^b	6	2.8	3.1	1.5
Adak King	2	2	14	29	13.7	35.4	16.6
Bering Sea Tanner Crab	11	1	0	12	5.7	8.1	3.8
Bering Sea Hair Crab	0	0	21	22	10.4	21.5	10.0
Statewide Scallops	0	0	8	15	7.1	11.0	5.1
Totals	37	23	91	211	100	213.0	100

^a Catcher-only vessels required to carry onboard Shellfish Observers.

^b Catcher-only vessel volunteered to carry onboard Shellfish Observer.

Table 7-10. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1996.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P	F/V ^a				
Adak Golden King	1	0	18	46	22.0	73.6	29.4
E. Aleutian Triangle Tanner	0	0	1	1	0.5	2.6	1.0
South Peninsula Grooved Tanner	0	0	6	10	4.9	10.5	4.2
E. Aleutian Grooved Tanner	0	0	3	6	2.9	5.8	2.3
W. Aleutian Grooved Tanner	0	0	1	2	1.0	4.3	1.7
Bering Sea Grooved Tanner	0	0	3	3	1.4	5.0	2.0
Bering Sea Snow Crab	15	13	0	49	23.4	54.8	21.9
Aleutian Islands Golden King ^b	1	0	16	34	16.3	49.9	19.9
St. Matthew Blue King ^c	3	3	0	7	3.3	3.8	1.5
Bering Sea Hair Crab	0	0	18	21	10.0	19.6	7.8
Bristol Bay Red King	4	1	0	7	3.3	2.5	1.0
Bering Sea Tanner	2	1	0	3	1.4	1.1	0.4
W. Aleutian Hair/Tanner Crab	0	0	1	1	0.5	0.3	0.1
Statewide Scallops	0	0	5	19	9.1	16.7	6.8
Totals	26	18	72	209	100	250.5	100

^a Catcher-only vessels required to carry onboard Shellfish Observers.

^b Combination of the former Adak and Dutch Harbor registration areas.

^c Includes Pribilof red and blue king crab fishery.

Table 7-11. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1997.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P	F/V ^a				
Aleutian Islands Golden King	3	0	12	53	33.8	82.2	44.6
Bering Sea Snow Crab	13	11	0	40	25.5	56.7	30.7
St. Matthew Blue King ^b	1	3	0	4	2.5	2.4	1.3
Bering Sea Hair Crab	0	0	16	16	10.2	11.6	6.3
Bristol Bay Red King	8	3	0	15	9.5	5.0	2.7
Statewide Scallops	0	0	6	24	15.3	21.2	11.5
Miscellaneous ^c	1	0	3	5	3.2	5.3	2.9
Totals	26	17	37	157	100	184.4	100

^a Catcher-only vessels required to carry onboard Shellfish Observers.

^b Includes Pribilof red and blue king crab fishery.

^c Includes Bering Sea snails, snow crab experimental, and Southeast urchin.

Table 7-12. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1998.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P	F/V ^a				
Aleutian Islands Golden King	3	1	13	35	18.8	63.8	31.4
Bering Sea Snow Crab	12	11	0	35	18.8	56.4	27.8
Bering Sea Snow Crab CDQ	0	0	20	25	13.4	33.1	16.3
St. Matthew Blue King	2	3 ^b	1 ^c	6	3.2	4.0	2.0
St. Matthew Blue King CDQ	0	0	2	2	1.1	1.2	0.6
Pribilof Red and Blue King	0	0	0	0	0	0	0
Pribilof King CDQ	0	0	1	1	0.5	0.6	0.3
Bering Sea Hair Crab	0	0	12	12	6.5	6.8	3.3
Bristol Bay Red King	11	3	0	22	11.8	8.1	4.0
Bristol Bay Red King CDQ	0	0	7	7	3.8	2.8	1.4
Statewide Scallops	0	0	8	41	22.1	26.3	12.9
Totals	28	18	64	186	100	203.1	100

^a Catcher-only vessels required to carry onboard Shellfish Observers.

^b Includes one vessel that also participated in Pribilof red and blue king crab fishery.

^c Catcher-only vessel not required to carry an onboard Shellfish Observer.

Table 7-13. Summary of registered vessels, observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea by fishery for the year 1999.

Fishery	Registered Vessels			Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
	C/P	F/P	F/V ^a				
Aleutian Islands Golden King	1	0	15	37	24.3	53.5	36.0
Bering Sea Snow Crab	10	11	0	27	17.8	50.0	33.7
Bering Sea Snow Crab CDQ	0	1	21	32	21.0	11.8	7.9
Bering Sea Hair Crab	0	0	8	8	5.3	5.3	3.6
Bristol Bay Red King	8	1	0	11	7.2	4.4	3.0
Bristol Bay Red King CDQ	0	0	10	10	6.6	2.8	1.9
Statewide Scallops	0	0	8	27	17.8	20.7	13.9
Totals	19	13	62	152	100	148.5	100

^a Catcher-only vessels required to carry onboard Shellfish Observers.

Table 7-14. Summary of registered scallop vessels, number of observer trips, and observer months at sea for Alaska weathervane scallop fisheries, 1993-1999.

	Registered Vessels							Observer Trips							Observer Months						
	1993	1994	1995	1996	1997	1998	1999	1993	1994	1995	1996	1997	1998	1999	1993	1994	1995	1996	1997	1998	1999
Adak	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	0	0	0	0
Bering Sea	9	8	0	1	2	4	2	12	8	0	1	2	6	4	9.7	12.6	0.0	2.6	2.6	3.3	3.9
Cook Inlet	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0.3	0	0	0	0	0
Dutch Harbor	5	3	1	0	1	4	1	6	4	3	0	1	6	1	2.0	0.6	2.0	0	0.5	2.6	0.5
Kodiak	9	11	0	5	5	8	6	30	26	0	9	10	12	9	15.5	18.7	2.0	7.6	10.0	9.1	6.7
Prince Wm. Sound	7	0	2	0	1	2	2	7	0	2	0	1	2	2	2.1	0	0.9	0	0.4	0.7	0.4
Alaska Peninsula	7	7	0	2	4	5 ^a	5	9	12	0	2	6	5	7	3.5	4.9	0	1.1	2.1	3.2	3.3
Southeast	1	0	0	0	0	x	x	1	0	0	0	0	x	x	0.3	0	0	0	0	x	x
Yakutat-January	x	10	8	3	4	x	x	x	10	9	3	4	x	x	x	3.6	7.8	1.7	5.6	x	x
Yakutat-July	7	5	x	3	x	8	3	7	5	x	3	x	10	4	3.1	2.7	x	3.7	x	7.4	5.9
Totals	45	46	12	14	17	31	19	72	67	15	18	24	41	27	36.2	43.4	13.0	16.7	21.2	26.3	20.7

x = Year in which selected fishery did not occur.

^a Includes one vessel that fished in January of 1998.

Table 7-15. Summary of registered vessels, total observer trips, percentage of total observer trips, observer months at sea, and percentage of total observer months at sea for Alaska weathervane scallop fisheries during 1999.

Scallop Fishery	Registered Vessels	Observer Trips	Percent of Total Observer Trips	Observer Months	Percent of Total Observer Months
Alaska Peninsula	5	7	25.9	3.3	16.2
Bering Sea	2	4	14.8	3.9	18.7
Dutch Harbor	1	1	3.7	0.5	2.4
Kodiak	6	9	33.4	6.7	32.2
Prince William Sound	2	2	7.4	0.4	1.9
Yakutat	3	4	14.8	5.9	28.6
Totals	19	27	100	20.7	100

Table 7-16. Number of briefing, debriefing, and midtrip debriefing sessions by month and by year, 1991 through 1999.

	Month												Totals
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
Briefings													
1991	44	18	34	31	27	9	5	3	12	38	46	14	281
1992	52	19	11	33	3	5	9	17	5	23	32	12	221
1993	44	7	25	3	1	6	7	6	19	32	30	1	181
1994	42	2	25	6	1	3	14	10	19	22	6	2	152
1995	39	18	9	10	9	5	6	23	17	49	17	3	205
1996	32	10	28	5	7	10	11	21	11	25	27	3	190
1997	28	6	16	4	4	3	2	17	8	19	27	1	135
1998	24	3	33	7	4	1	3	20	16	28	17	0	156
1999	22	1	13	2	2	1	2	14	3	36	7	2	105
Debriefings													
1991	29	23	28	28	30	37	18	4	11	3	46	24	281
1992	31	21	11	73	5	5	3	13	17	5	27	15	226
1993	18	9	49	10	1	5	5	8	22	3	26	27	183
1994	7	2	54	13	3	3	8	15	19	1	14	16	155
1995	2	48	6	6	12	6	7	10	13	28	33	26	197
1996	6	10	36	3	13	8	10	18	10	9	30	26	179
1997	5	4	31	4	7	5	0	8	7	11	43	9	135
1998	0	3	30	9	19	7	4	7	12	33	33	2	159
1999	0	1	25	19	16	4	2	0	3	25	20	12	127

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	Month												Totals
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
Mid Trip Debriefings													
1991	0	15	32	9	6	3	1	0	1	2	4	16	89
1992	18	20	19	5	0	0	1	1	0	0	3	17	84
1993	9	8	1	2	2	3	2	6	1	0	6	8	48
1994	0	0	2	6	4	1	6	13	0	3	6	2	43
1995	0	4	5	7	10	6	3	3	14	7	15	2	76
1996	4	2	4	20	16	8	18	3	13	19	7	8	122
1997	4	12	7	6	4	2	8	0	12	8	12	3	78
1998	8	11	4	4	12	6	2	1	15	4	0	0	67
1999	1	7	2	1	1	0	1	1	18	10	8	2	52

Table 7-17. Mandatory Shellfish Observer Program candidates by exam, number of candidates, number passed, number currently certified at year's end, and number of decertified observers.

Year	Number of Exams	Number of Candidates	Number Passed	Number Currently Certified	Number Certified at Year's End	Number Decertified	
						Inactivity ^a	Other ^b
1988	3	105	84	0	80	68	16
1989	1	54	42	2	98	33	7
1990	3	47	29	0	119	27	2
1991	4	66	61	1	99	55	5
1992	2	41	39	1	103	38	0
1993	2	19	19	0	62	16	3
1994	1	6	6	0	83	5	1
1995	3	54	54	8	77	42	4
1996	3	30	30	7	75	21	2
1997	2	25	23	5	55	17	1
1998	2	20	20	9	44	11	0
1999	1	9	8	2 ^c	35	0	0
Totals	27	476	415	35	Not Applicable	333	41

^a Decertified due to 12-month shellfish observer employment inactivity or trainee permit expiration after 180 days.

^b Decertification for non-compliance with Shellfish Observer Program standards.

^c At year's end, 6 of the 1999 trainees were still working to obtain certification.

Table 7-18. Mandatory Scallop Observer Program candidates by exam, number of candidates, number passed, number currently certified at year's end, and number of decertified observers.

Year	Number of Exams	Number of Candidates	Number Passed	Number Currently Certified	Number Certified at Year's End	Number Decertified	
						Inactivity ^a	Other ^b
1991	0	5 ^c	5 ^c	0	5 ^c	4	1
1992	0	0	0	0	0	0	0
1993	3	19	19	0	22 ^c	18	1
1994	4	17	16	0	20 ^c	13	3
1995	0	0	0	0	17	0	0
1996	2	10	10	0	6	10	0
1997	2	10	10	2	8	8	0
1998	1	9	9	2	9	7	0
1999	1	8	8	6	10	2	0
Totals	13	78	77	10	Not Applicable	62	5

^a Decertified due to 12-month scallop observer employment inactivity or trainee permit expiration after 180 days.

^b Decertification for non-compliance with Shellfish Observer Program standards.

^c Additional people briefed and deployed without attending a class.

Table 7-19. Number of observer trips and observer trips where evidence was collected, excluding scallop trips.

Fishery	Fishing Season (Year)	Observer Trips	Trips with Evidence	Percent of Observed Trips ^a	Percent of Year's Evidence ^b
Saint Matthew/ Pribilof Red and Blue King Crab	1991	11	0	0	0
	1992	15	1	6.7	2.4
	1993	11	1	9.1	5.6
	1994	11	1	9.1	6.7
	1995	7	1	14.3	4.3
	1996	7	4	57.1	19.0
	1997	4	0	0	0
	1998	6	1	16.7	2.5
	1999	<i>No Fishery</i>	**	**	**
Dutch Harbor Golden King	1991	4	1	25.0	2.4
	1992	6	1	16.7	2.4
	1993	0	0	0	0
	1994	2	1	50.0	6.7
	1995	19	0	0	0
Adak Area Red and Golden King	1991	21	3	14.3	7.1
	1992	20	5	25.0	11.9
	1993	12	1	8.3	5.6
	1994	11	2	18.2	13.3
	1995	29	5	17.2	21.7
	1996	46	3	6.5	14.3
<i>1996 Golden King fishery only</i>					
Aleutian Island Golden King ^c	1996	34	6	5.9	28.6
	1997	53	13	24.5	54.2
	1998	35	11	31.4	26.8
	1999	37	1	2.7	10.0

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Fishery	Fishing Season (Year)	Observer Trips	Trips with Evidence	Percent of Observed Trips ^a	Percent of Year's Evidence ^b
Bristol Bay Red King	1991	39	8	20.5	19.0
	1992	24	8	33.3	19.0
	1993	25	3	12.0	16.7
	1994	<i>No Fishery</i>	**	**	**
	1995	<i>No Fishery</i>	**	**	**
	1996	7	0	0	0
	1997	15	3	20.0	12.5
	1998	22	3	13.6	7.3
	1999	11	3	27.3	30.0
Bering Sea Snow Crab	1991	149	18	12.1	42.9
	1992	106	19	17.9	45.2
	1993	63	8	12.7	44.4
	1994	55	8	14.5	53.3
	1995	50	14	28.0	60.9
	1996	49	3	6.1	14.3
	1997	40	4	10.0	16.7
	1998	35	11	31.4	26.8
	1999	27	5	18.5	50.0
Bering Sea Tanner Crab	1991	53	12	22.6	28.6
	1992	43	8	18.6	19.0
	1993	23	5	21.7	27.8
	1994	10	2	20.0	13.3
	1995	12	2	16.7	8.7
	1996	3	0	0	0
	1997	<i>No Fishery</i>	**	**	**
	1998	<i>No Fishery</i>	**	**	**
	1999	<i>No Fishery</i>	**	**	**

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Fishery	Fishing Season (Year)	Observer Trips	Trips with Evidence	Percent of Observed Trips ^a	Percent of Year's Evidence ^b
Bering Sea Hair Crab	1992	3	0	0	0
	1993	14	0	0	0
	1994	12	0	0	0
	1995	22	0	0	0
	1996	21	3	14.3	14.3
	1997	16	4	25.0	16.7
	1998	12	2	16.7	4.9
	1999	8	0	0.0	0.0
Grooved Tanner Crab All Areas ^d	1994	17	1	5.9	6.7
	1995	52	1	1.9	4.3
	1996	21	2	9.5	9.5
	1997	0	0	0	0
	1998	0	0	0	0
	1999	0	0	0	0
Miscellaneous Fisheries ^e	1992	8	0	0	0
	1993	15	0	0	0
	1994	0	0	0	0
	1995	5	0	0	0
	1996	2	0	0	0
	1997	5	0	0	0
	1998	0	0	0	0
	1999	0	0	0	0
Community Development Quota Fisheries ^f	1998	35	13	37.1	31.7
	1999	42	1	2.4	10.0

-continued-

Table 7-19. (Page 4 of 4)

Fishery	Fishing Season (Year)	Observer Trips	Trips with Evidence	Percent of Observed Trips ^a	Percent of Year's Evidence ^b
Summary	1991	277	42	15.2	NA
	1992	225	42	18.7	
	1993	163	18	11.0	
	1994	118	15	12.7	
	1995	196	23	11.7	
	1996	190	21	11.0	
	1997	133	24	18.0	
	1998	145	41	28.3	
	1999	125	10	8.0	

^a Percentage of trips in which evidence was collected.

^b Percentage of total evidence collected, by fishery, for the fishing year (January 1 through December 31).

^c In 1996 the Adak and Dutch Harbor king crab registration areas were consolidated into the Aleutian Islands area 'O' king crab registration area and opened on September 1st, the traditional opening time of the former Dutch Harbor area.

^d Grooved Tanner crab areas include the following: Bering Sea, Western Aleutian, Eastern Aleutian, Kodiak, Alaska Peninsula, and Southeastern Alaska.

^e Miscellaneous fisheries for all years can include: Bering Sea golden king crab, Bering Sea and Eastern or Western Aleutian octopus, surf clam, snail, St. Lawrence blue king crab, Norton Sound red king crab, Eastern Aleutian triangle Tanner crab, Western Aleutian Tanner crab, Western Aleutian hair crab, Southeast miscellaneous (urchins, shrimp, etc.), and Bering Sea snow crab CDQ experimental.

^f CDQ fisheries include Bering Sea snow crab, St. Matthew blue king crab, Pribilof red and blue king crab, and Bristol Bay red king crab.

Table 7-20. Mandatory Shellfish Observer Program cost recovery harvest statistics.

Year	Number of		Harvest ^{a,b}	Number of Pots Pulled	Average		Deadloss ^a
	Landings	Crabs			CPUE	Weight ^a	
1999 ^c	2	16,930	106,179	541	31.0	6.3	245

^a In pounds.^b Deadloss included.^a Cost recovery fishing occurred after the open access Bristol Bay red king crab fishery.

Table 7-21. Economic performance, 1999 Mandatory Shellfish Observer Program cost recovery harvest.

Harvest ^a	Value (dollars)		Charter Dates	Total charter days
	Exvessel	Total		
105,934	\$6.32/lb.	\$669,500	10/25-11/10	17

^a In pounds, deadloss not included.

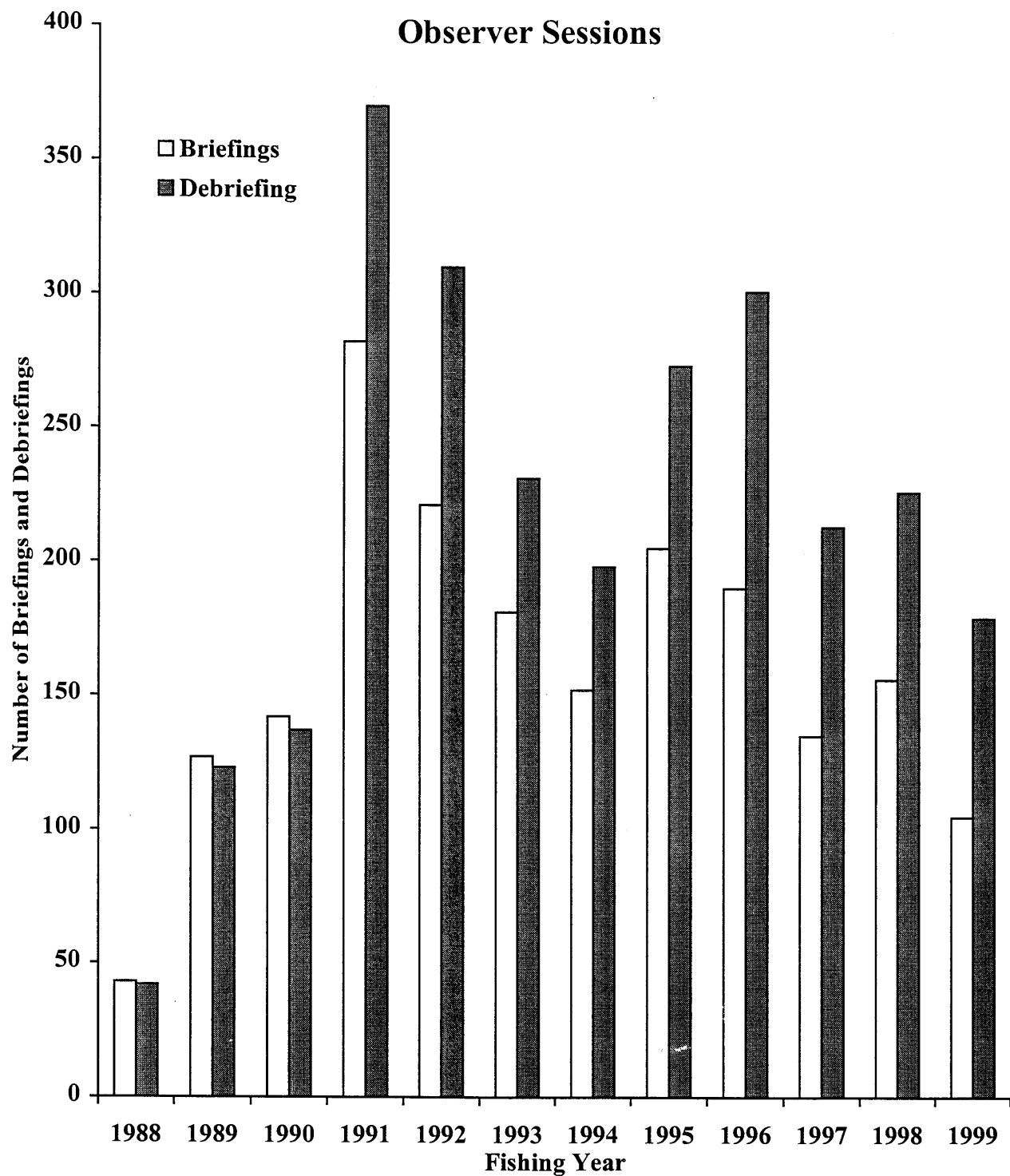


Figure 7-1. Number of briefing and debriefings (including midtrip debriefing) sessions by fishery year, 1988-1999.

Observer Sessions

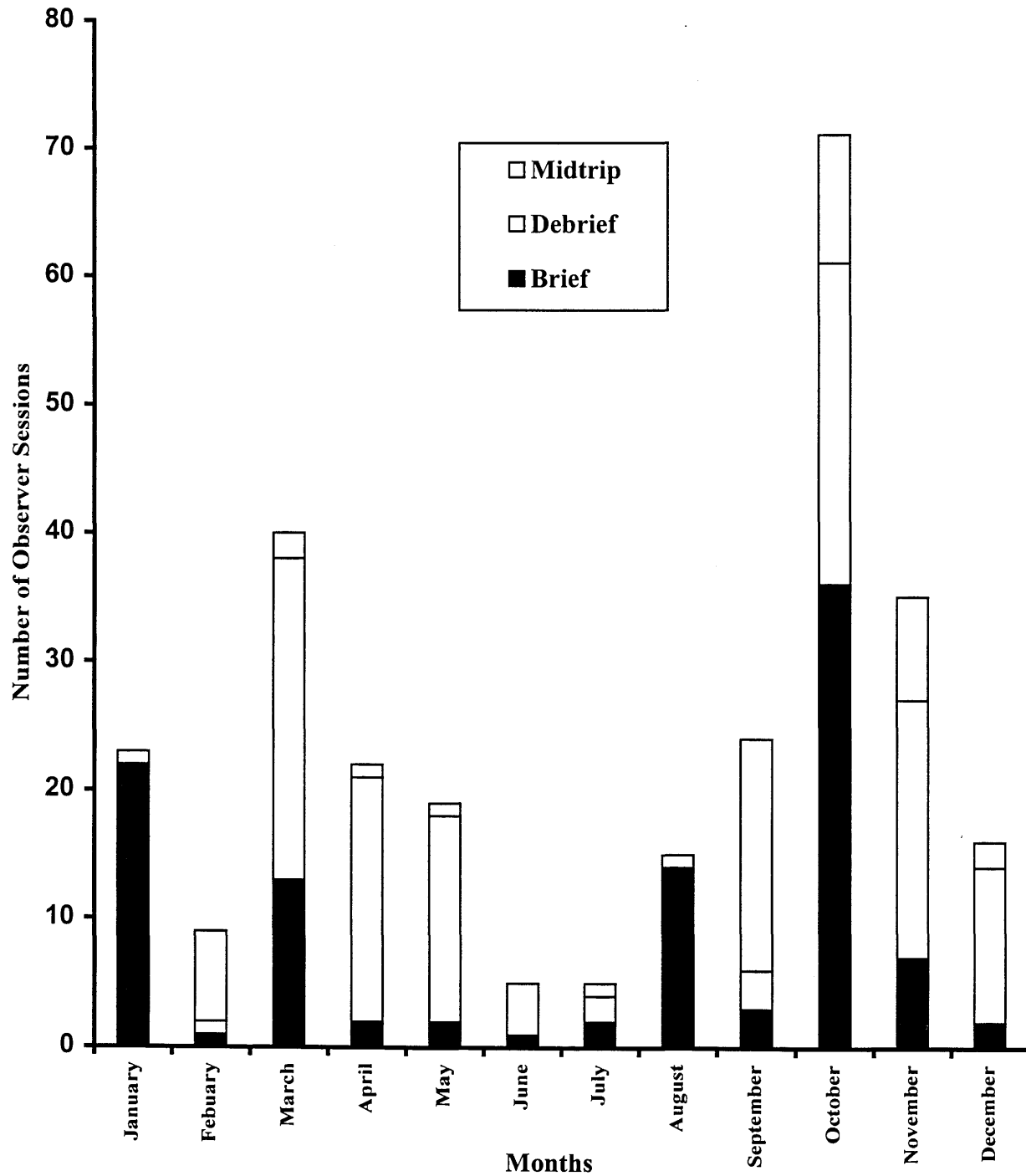


Figure 7-2. Number of observer sessions by month and session type (briefings, debriefings, midtrip debriefings) for the year 1999.

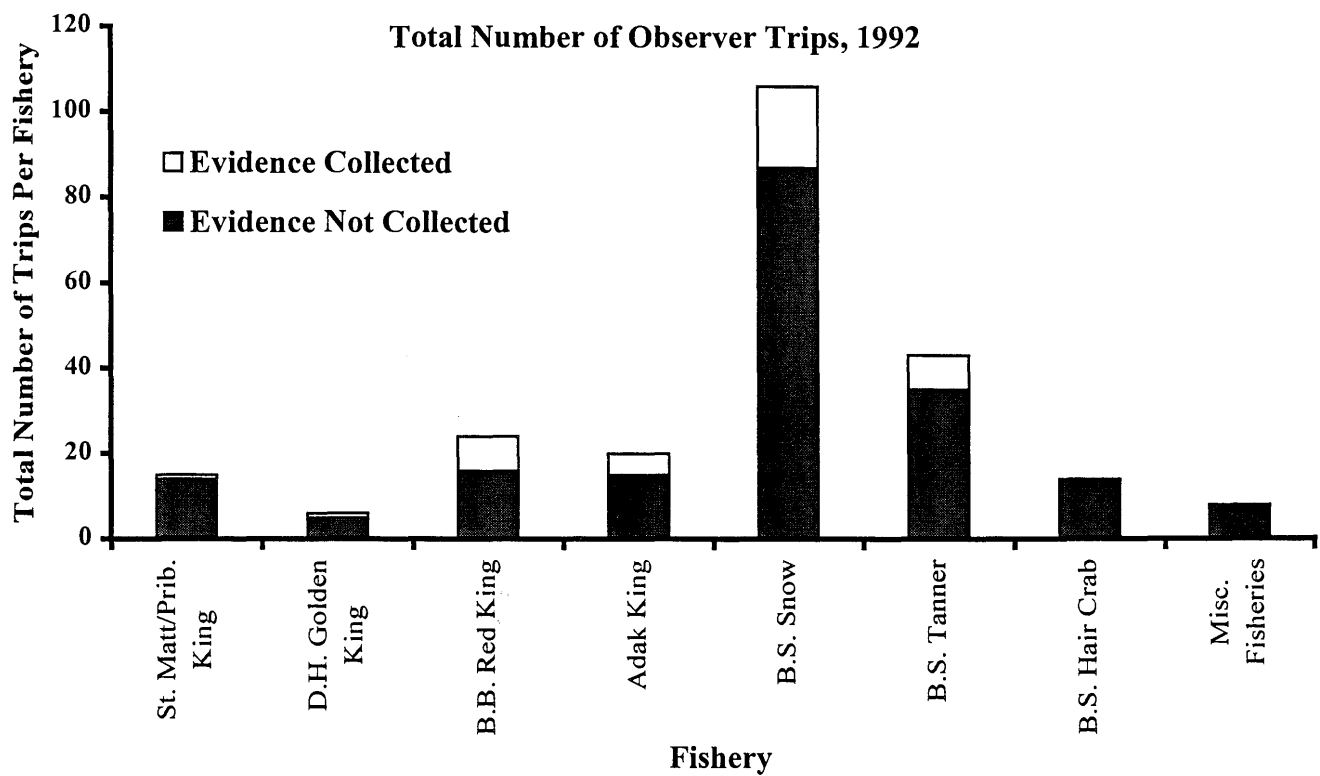
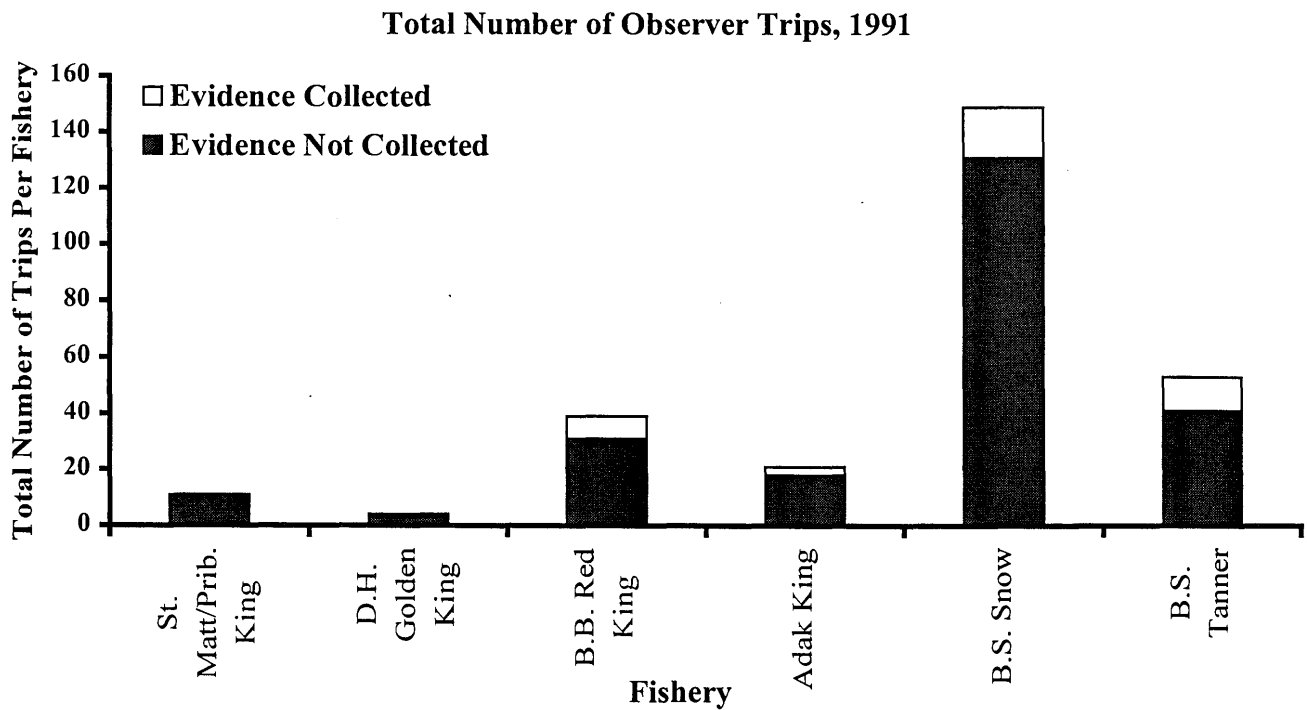
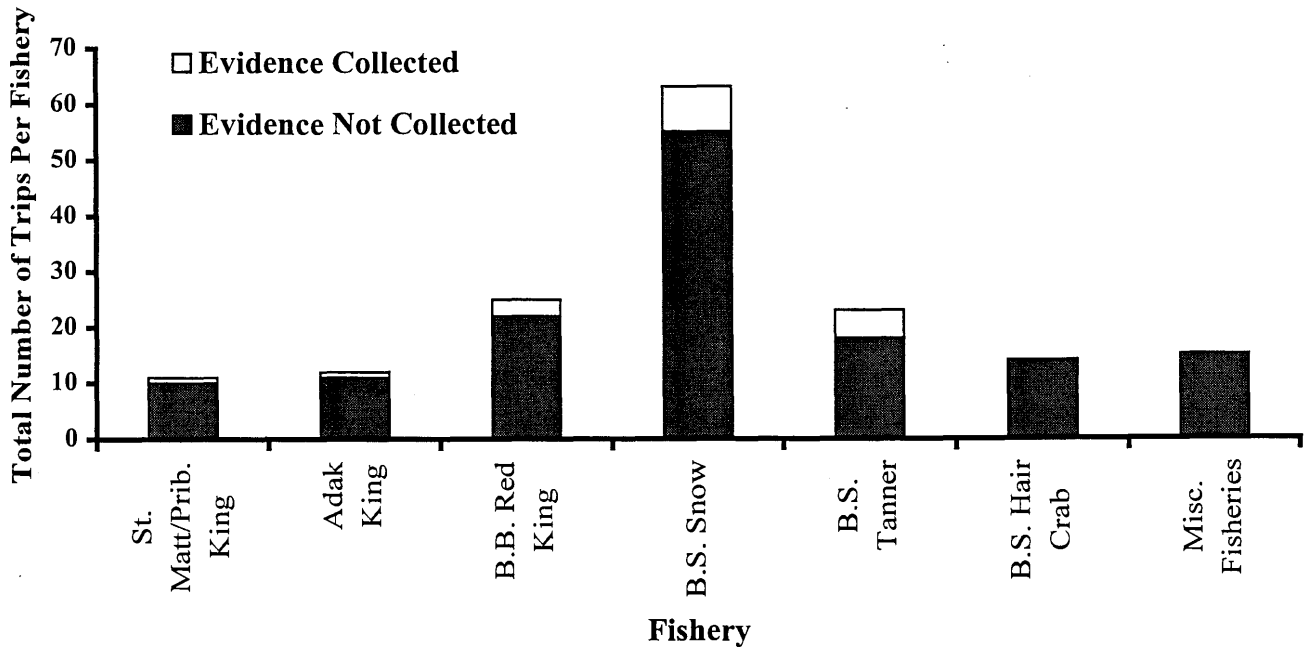


Figure 7-3. Total number of observer trips, and trips where evidence was collected, for the years 1991 and 1992.

Total Number of Observer Trips, 1993



Total Number of Observer Trips, 1994

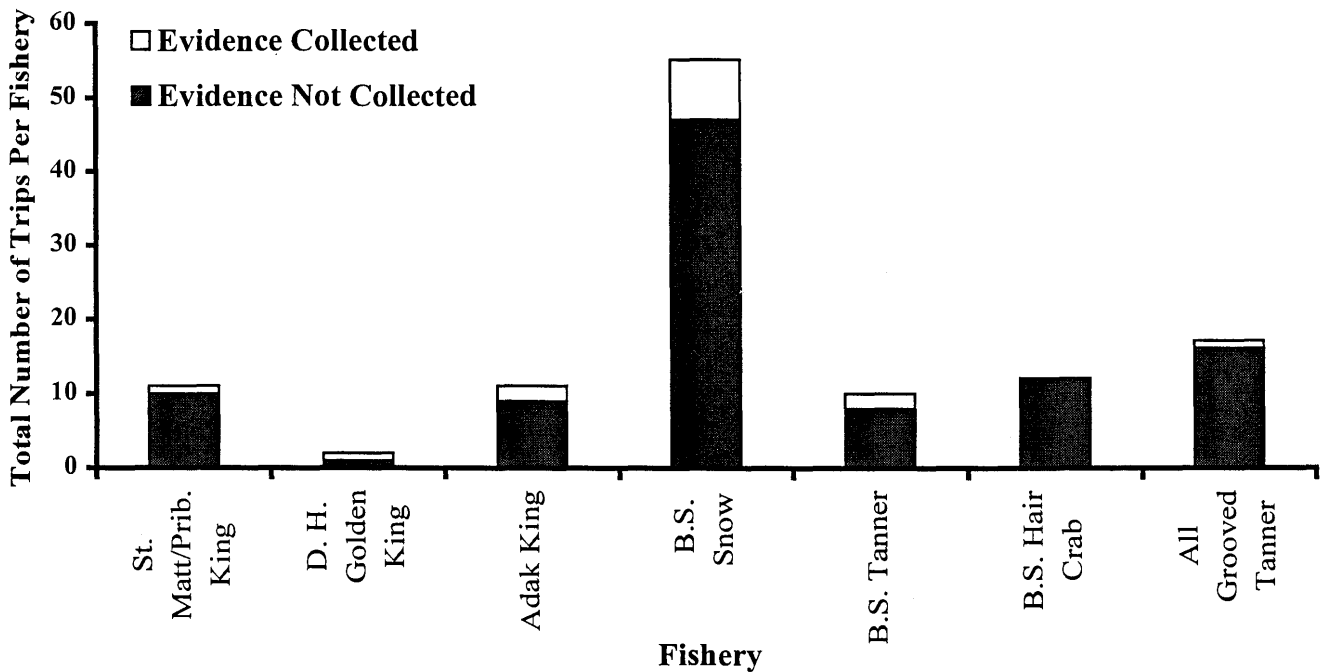
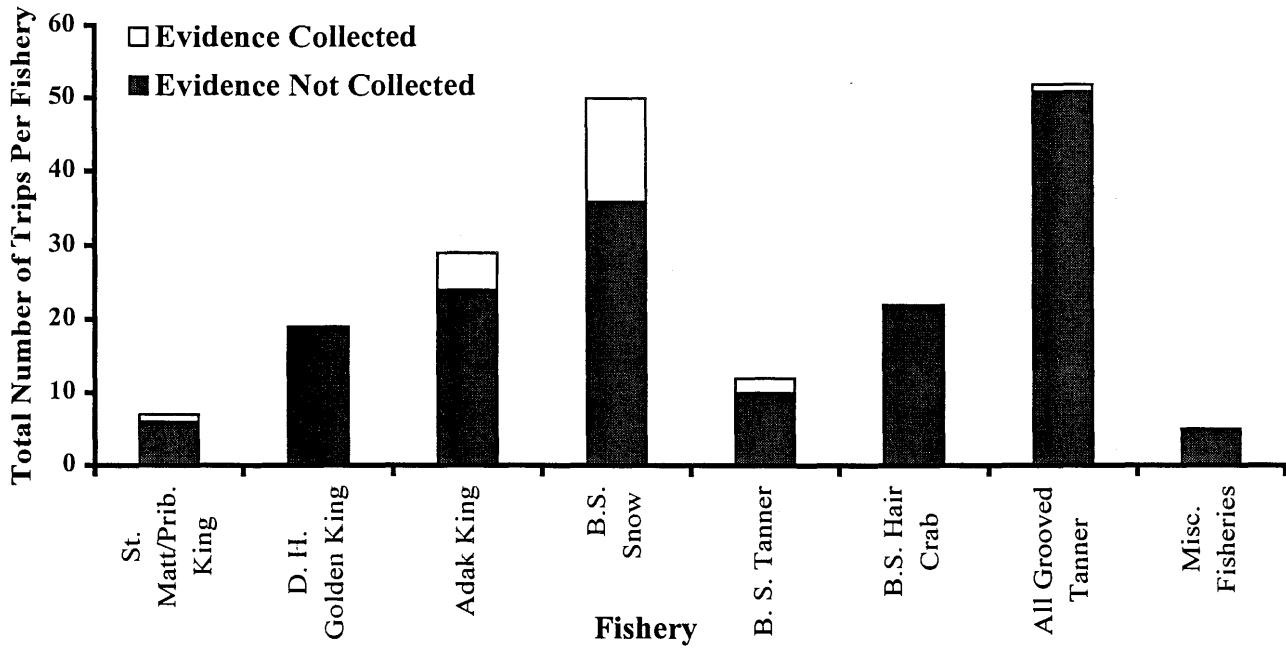


Figure 7-4. Total number of observer trips, and trips where evidence was collected, for the years 1993 and 1994.

Total Number of Observer Trips, 1995



Total Number of Observer Trips, 1996

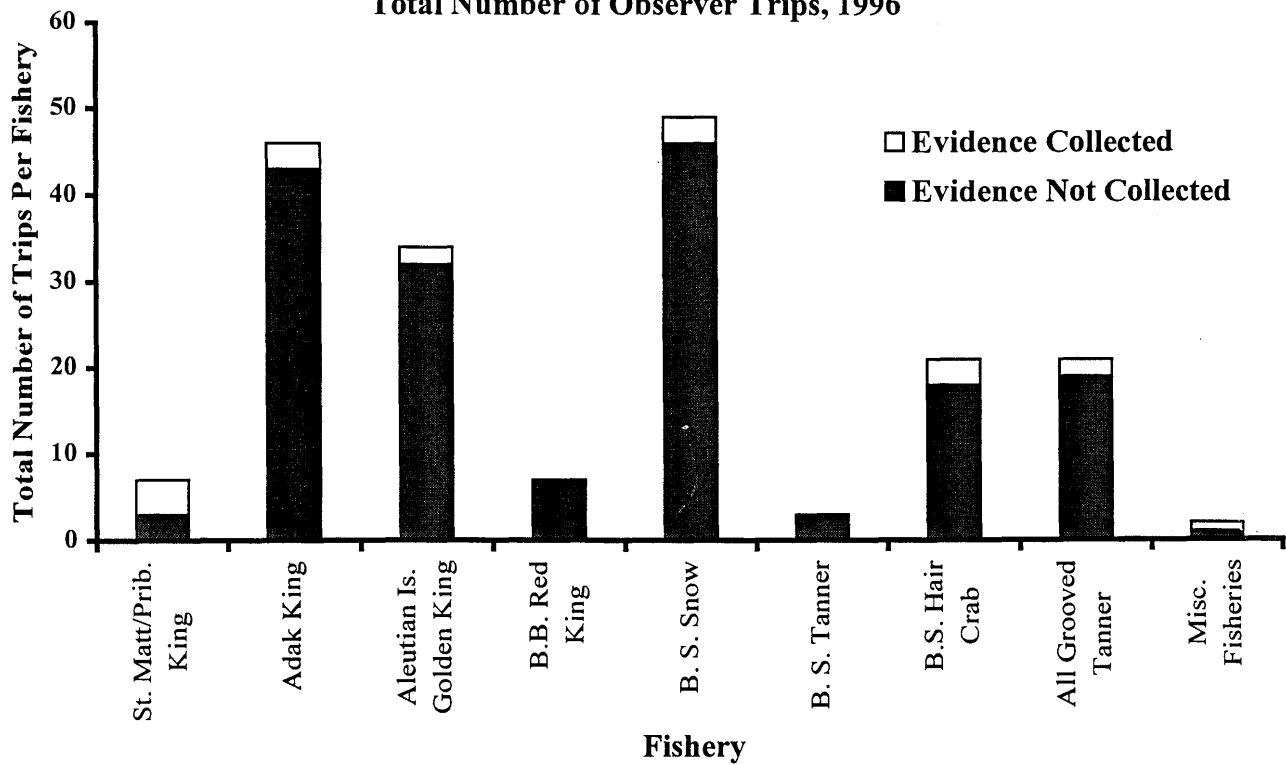
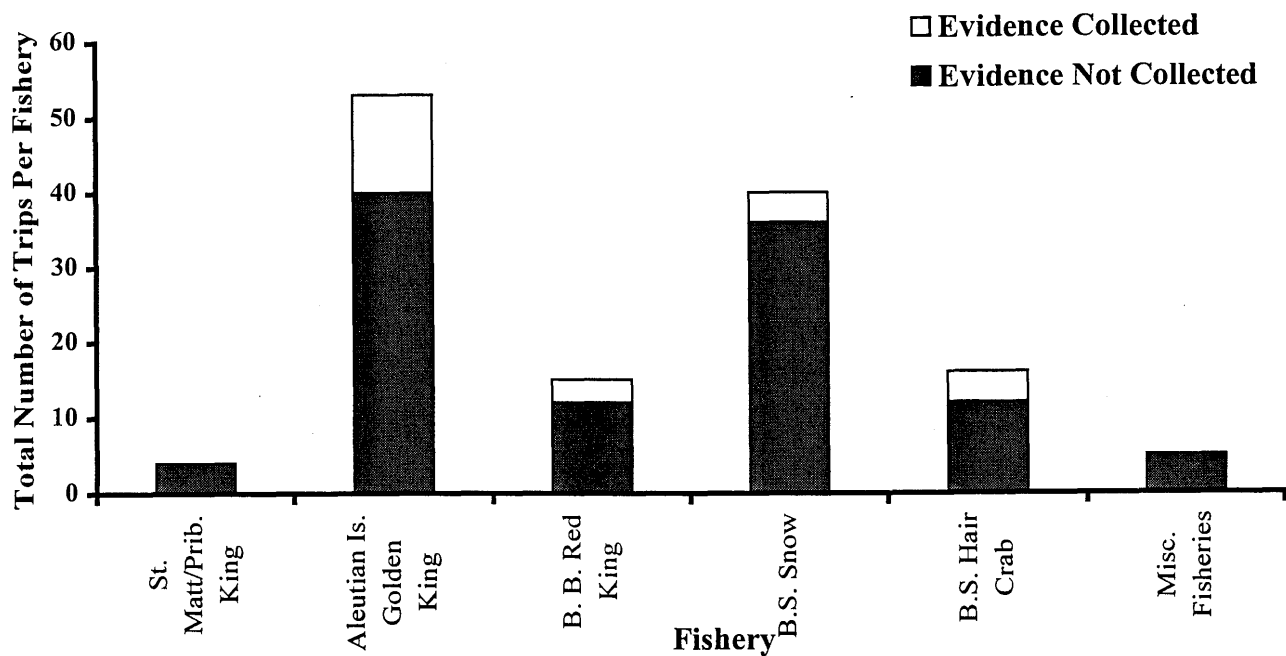


Figure 7-5. Total number of observer trips, and trips where evidence was collected, for the years 1995 and 1996.

Total Number of Observer Trips, 1997



Total Number of Observer Trips, 1998

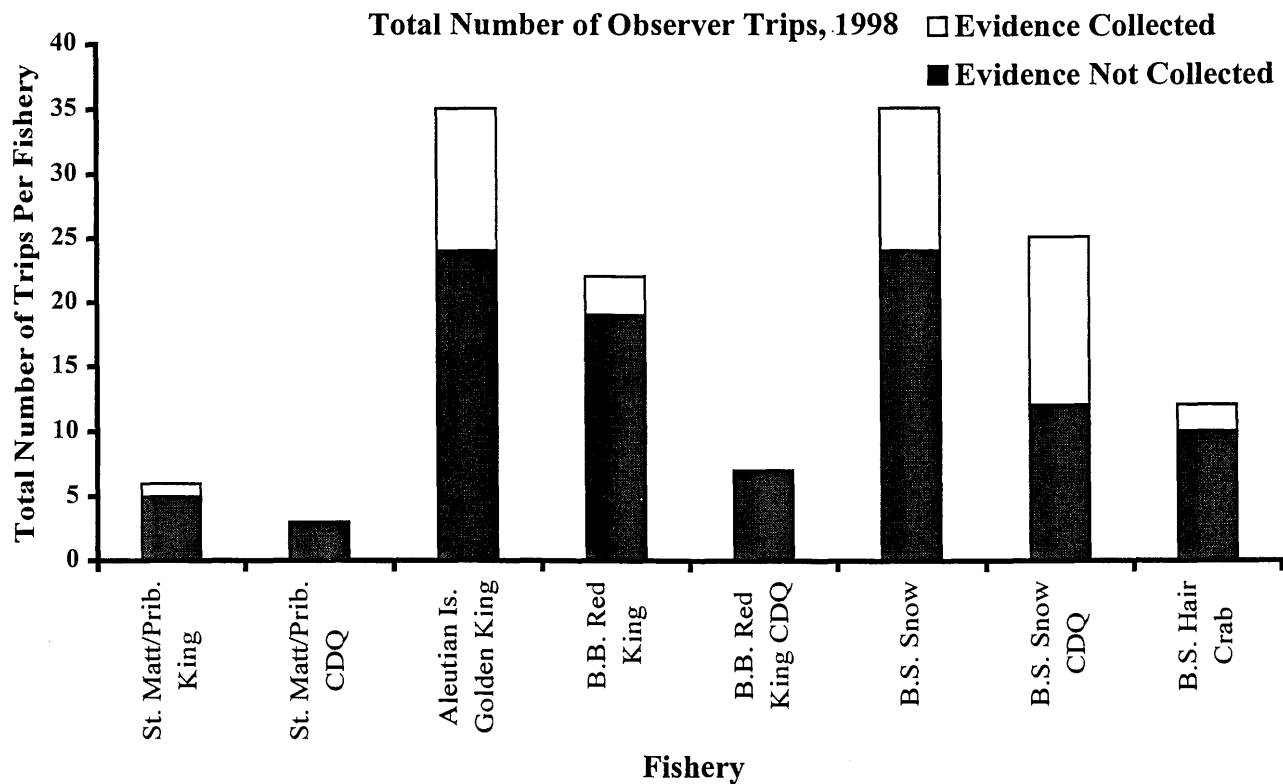


Figure 7-6. Total number of observer trips, and trips where evidence was collected, for the years 1997 and 1998.

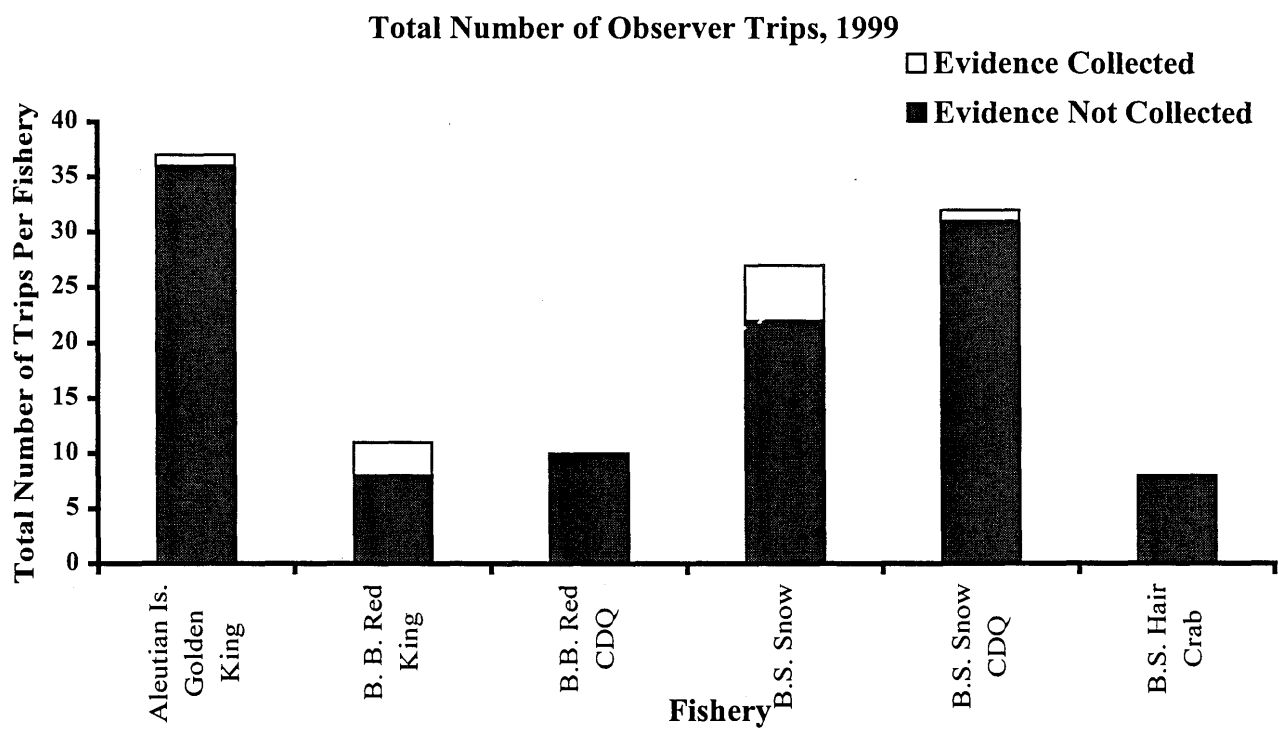


Figure 7-7. Total number of observer trips, and trips where evidence was collected, for the year 1999.

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